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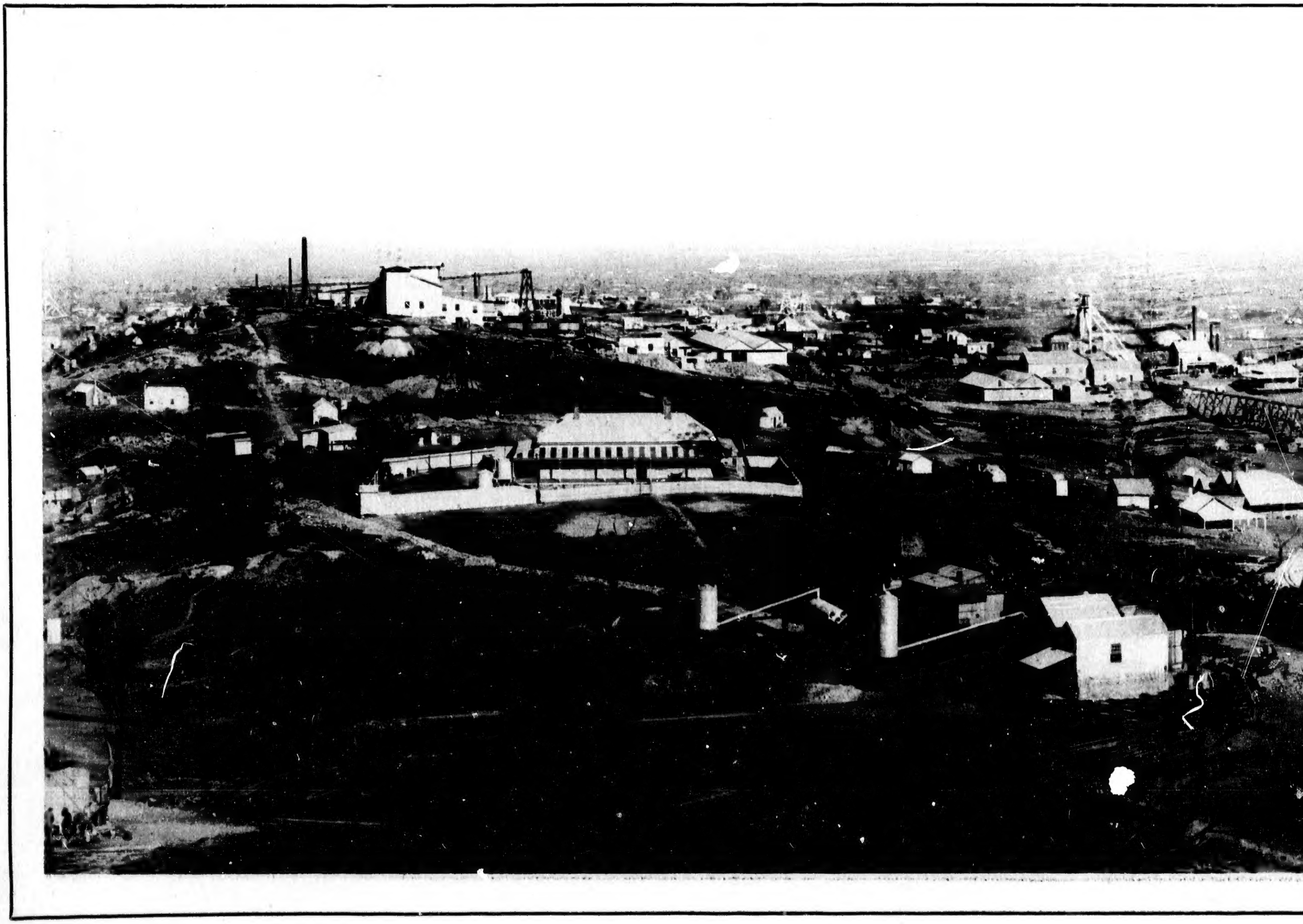
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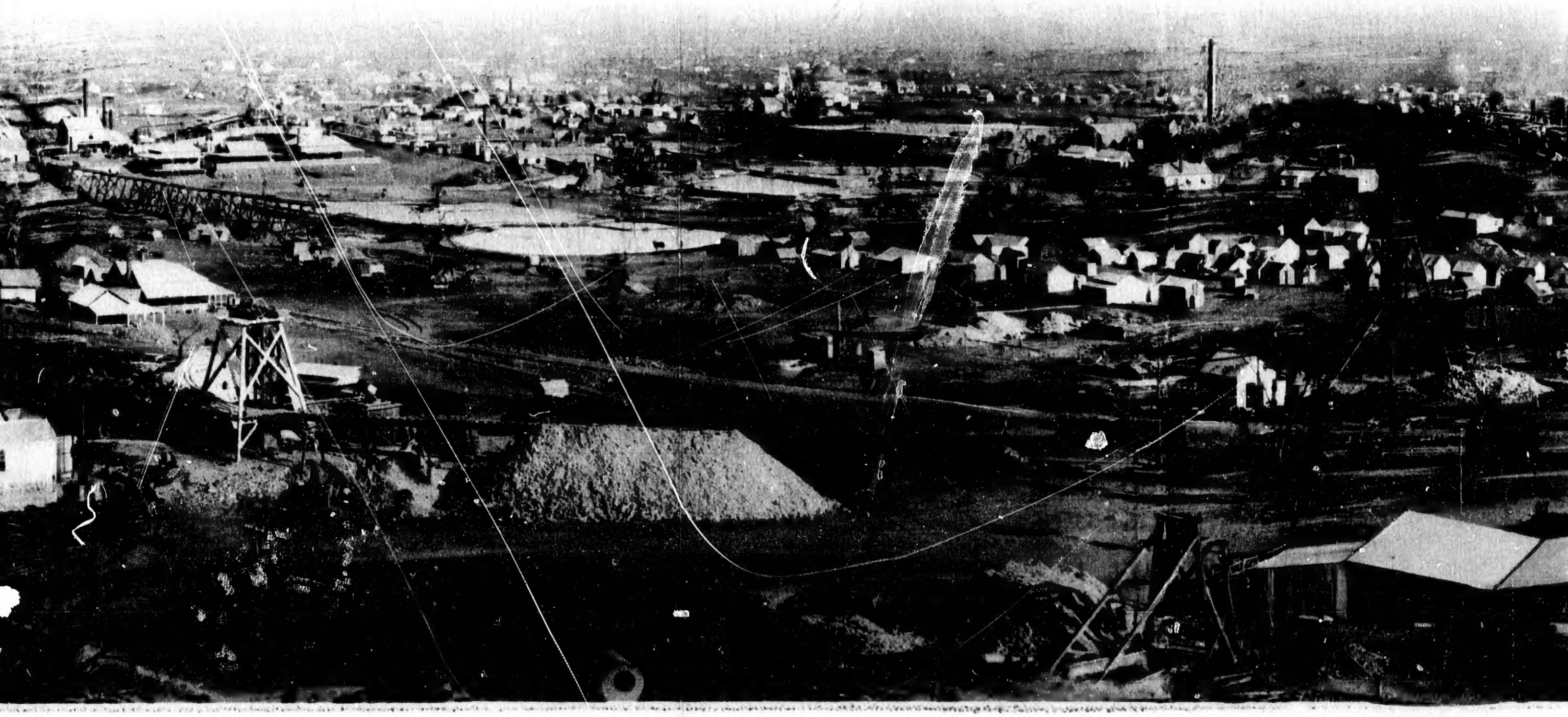

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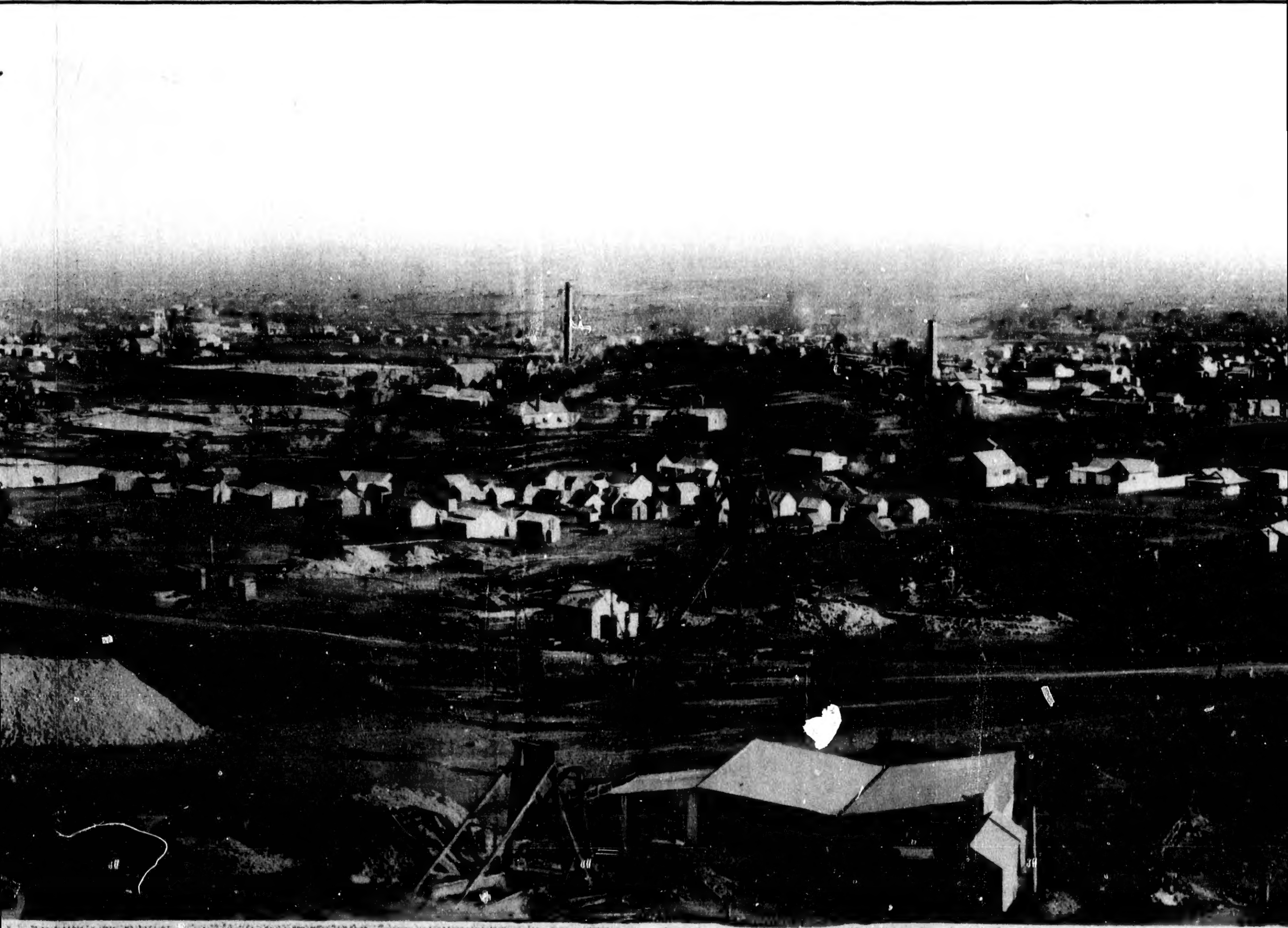

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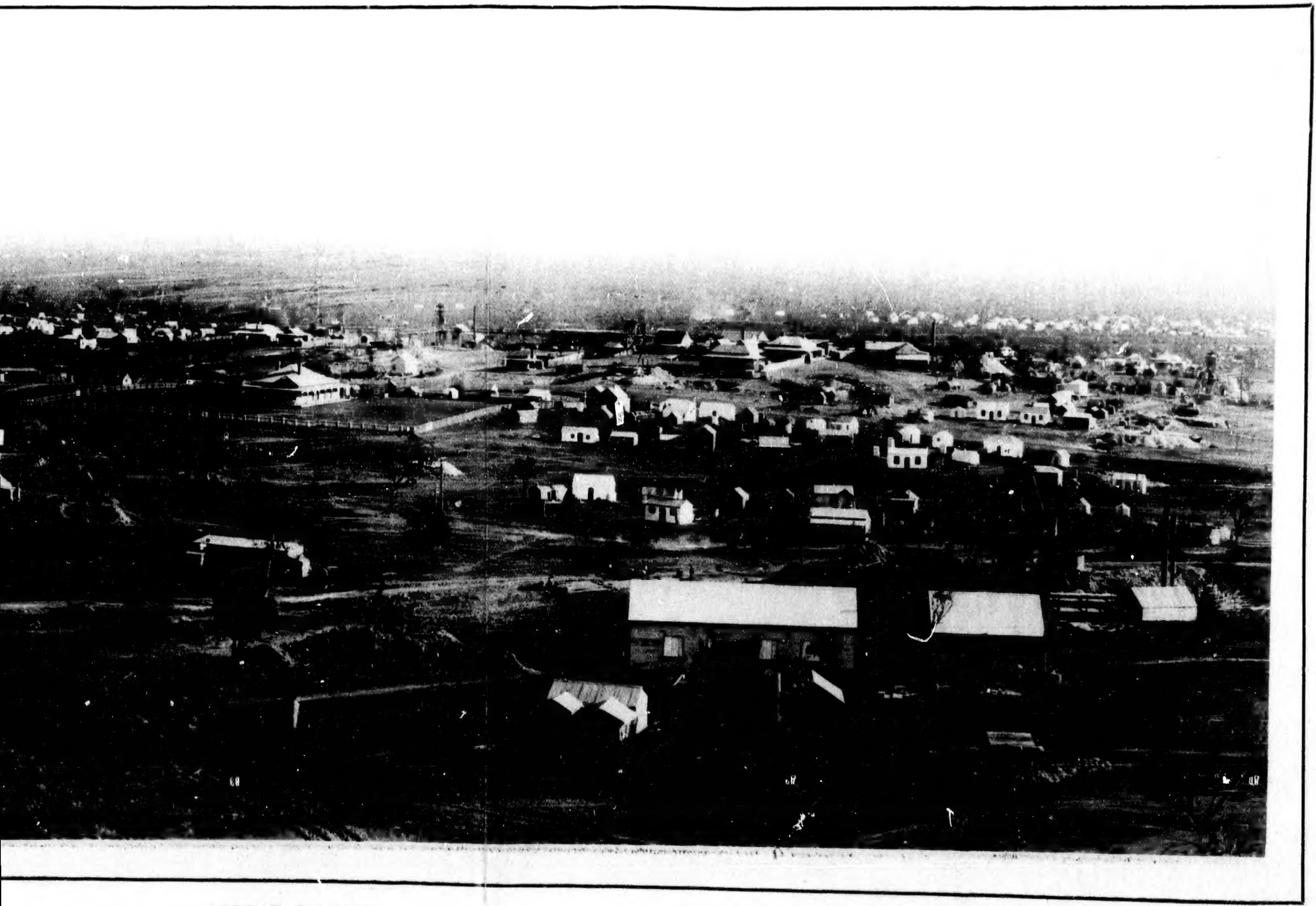
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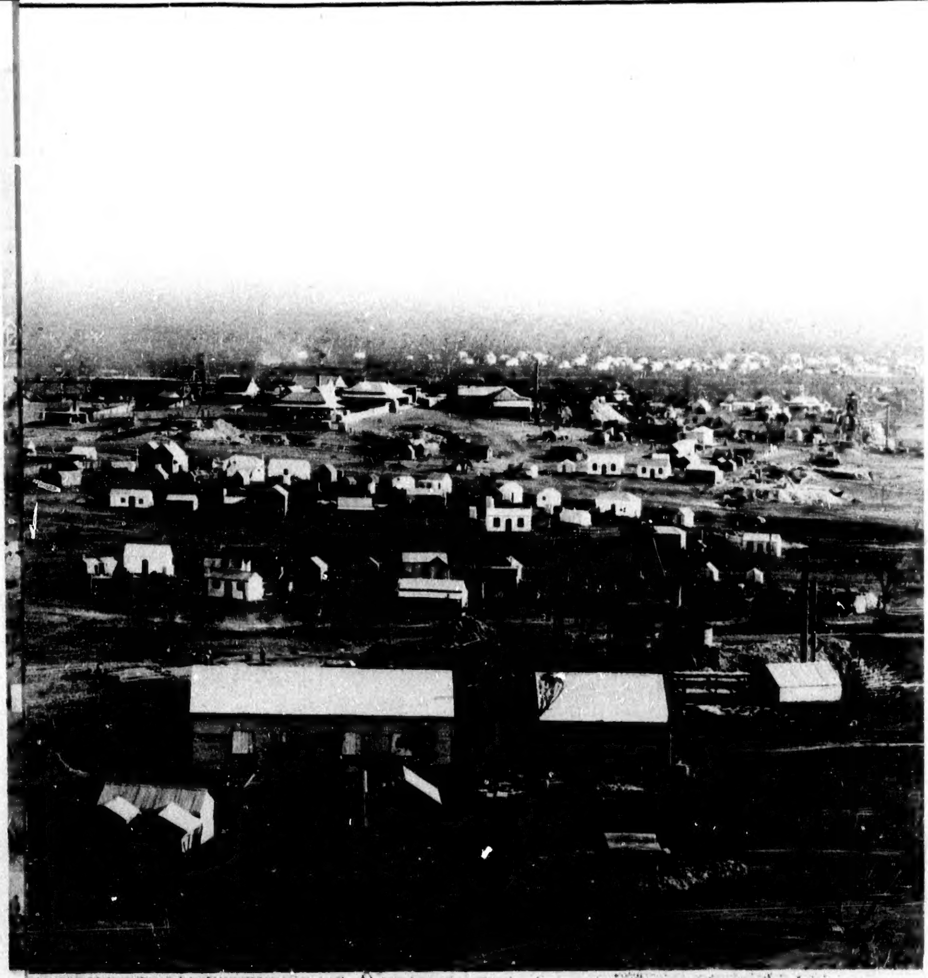

BOULDER PERSEVERANCE.

GEOLOGICAL SURVEY
OTTAWA
MAR 5 1900
CANADA.
DEPARTMENT.

THE
GOLD MINES OF THE WORLD

CONTAINING

CONCISE AND PRACTICAL ADVICE FOR INVESTORS

GATHERED FROM

A PERSONAL INSPECTION OF THE MINES

OF THE

TRANSVAAL, INDIA, WEST AUSTRALIA,

QUEENSLAND, NEW ZEALAND,

BRITISH COLUMBIA AND RHODESIA

BY J. H. CURLE

ILLUSTRATED WITH PLANS AND PHOTOGRAPHS

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CHAPTER I.

INTRODUCTORY.

Title.

In naming this book "The Gold Mines of the World," I must proclaim myself guilty of sacrificing strict accuracy of expression to the desire for an effective title.

In so far that I have not inspected mines in the United States, Mexico, Russia, and other prominent gold-producing countries, this book cannot be said to embrace the "gold mines of the world": at a future date I intend to visit these other mines, but whether I shall venture to embody the results in a second volume, or not, will depend on circumstances.

English capital and gold mines.

In the meantime, I have inspected, I think very thoroughly, the gold mines of the seven countries in which I imagine English capital is most heavily invested, that is to say:—The Transvaal, India, West Australia, Queensland, New Zealand, British Columbia, and Rhodesia.

A summary of mines inspected.

Of the 228 gold mines that I have inspected underground, almost all are situated in the above-named seven countries, and are thus apportioned:—

In the Transvaal I have inspected 88 mines,
In India ,, ,, 13 ,,
In West Australia ,, ,, 43 ,,
In Queensland ,, ,, 36 ,,
In New Zealand ,, ,, 25 ,,
In British Columbia ,, ,, 10 ,,
In Rhodesia ,, ,, 10 ,,

In addition to this I have been in many private gold mines, not here enumerated, and have gained useful collateral experience from a number of copper, silver, lead, coal, and diamond mines, which I have visited in my travels.

Of course there are far more than 228 gold mines described, or alluded to, in this book: in many cases I have had reports, plans, and other valuable information put at my disposal, and in such a manner that it was a matter of little difficulty to gain an accurate idea of the mine in question even without visiting it.

Although often unfurnished with introductions, I almost invariably received the greatest courtesy at the hands of the managers of mines. Many of these put themselves to great trouble to furnish me with the information I required.

Refused admission to several mines.

The only important mine that I was refused permission to inspect was the Boulder Perseverance in West Australia, and I do not suppose that there were more than six mines in all which were absolutely closed to me.

The "Economist."

Much of the information contained in this book has appeared, at one time or another, during the past three years, under a somewhat different guise, in the pages of the "Economist," and I have to thank the Editor of that paper for allowing me a free hand in drawing on his back numbers.

A proposed series of standard measurements to be used in gold mining, for a ton:

I am afraid it is hopeless to expect that the Governments and Chambers of Mines of all countries would agree to fix upon a series of standard measurements to apply to gold mines. In South Africa a ton is 2,000 lbs.: in India it is 2,240. An ounce of gold is worth about 75s. in Africa, if from the mill, but only 60s., if from cyanide treatment: in West Australia, at Kalgoorlie, most of the gold is worth 80s.: at Coolgardie it is worth 72s.: in Queensland it is frequently worth only 30s.: and in New Zealand, owing to the presence of a large amount of silver, is often worth no more than 20s.: in British Columbia most of the returns are from smelting, and the gold is worth 84s.

For bullion:

For mine costs:

Then as regards working expenses. In one mine every cash outlay for the month will be charged (the only honest way, I consider) to working expenses, while in another, perhaps an adjoining property, the cabled monthly profit will have omitted from it capital expenditure, development of ore, and, probably, all managerial and head office expenses.

For assays.

In the publishing of assays there are endless irregularities. If the assay is high, but the reef very narrow, thereby reducing the mining value materially, the width is often carefully omitted: if a series of assays, the rich ones are picked out, as if at random, for publication: some give results in fine gold, some in bullion.

All these points should be altered.

System is necessary.

In an industry such as gold mining, where sophistry already holds such sway, where the silvery-tongued chairman invariably draws his hearers' attention to the good features only, and where a subsidised section of the press is at work, night and day, in its patrons' interests, it is of the highest importance that, wherever possible, statements to shareholders or to the public should be reduced to system, and be subject to legal penalties.

Suggested alterations.

To this end I would suggest that the mining ton should invariably be reckoned at 2,000 lbs.: that all returns per ton should be made in sterling, not in troy weight: that the ounce, wherever referred to, should be reckoned as fine gold, viz., 84s., and that all assays, and yields of battery, smelted, cyanide, or slimes, gold, should be announced on this basis: that all working expenses be reckoned so as to include every cash outlay during the month, and that the profit announced, whether it be monthly or quarterly, be the profit, with depreciation deducted, which is actually available for dividend: that in publishing assays the width of the reef should invariably accompany the value, and the value itself should, preferably, be stated in sterling.

Only gold mining companies have been dealt with in this book.

Exploration and finance companies not dealt with.

The columns of the financial papers swarm nowadays with the doings of the hundreds of exploration and finance companies that have been formed to operate in one or more of the mining countries, and the shares of which are usually quoted with those of the mines of that particular country.

Of these exploration companies, a few are engaged in developing or working their own mines, and some of these, such as the British America Corporation, the Consolidated Gold Fields of New Zealand, and the Gold Fields of Mysore, are dealt with. But the immense majority of these companies "toil not, neither do they spin." The chief object of their controllers is to float new mines, or to reconstruct, or to amalgamate old ones, and, collectively, they are responsible for the printing and the off-loading of an immense amount of worthless scrip among the public. A great deal of the utter rottenness that has crept into gold mining, is due to the unscrupulous methods of men, "masters of finance" their subsidised papers call them, who have founded these finance companies, and who even to-day, on the slightest encouragement from a systematically gulled public, are standing ready to continue, at a moment's notice, their nefarious schemes.

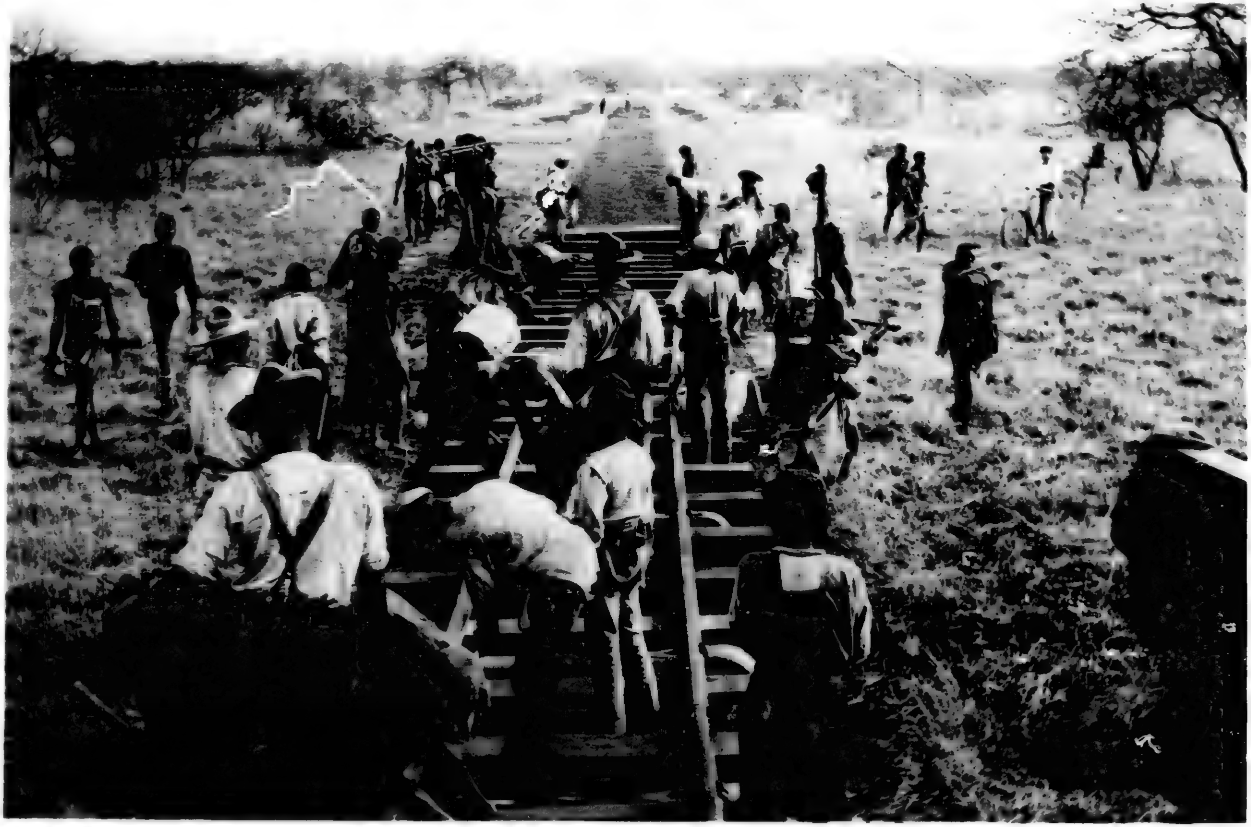
There are, of course, exploration and finance companies, such as the Rand Mines Limited, the Consolidated Gold Fields of South Africa, or the New Zealand Mines Trust, which have had wonderfully successful careers: but these companies are but few, compared with the number of those of a different class.

The harm done by these companies.

As I do not intend to criticise these companies, there is no necessity to mention the names of, say, a hundred of the bad ones, but I should like readers of this to realise that in buying the shares of such they are usually playing into the hands of enemies.

It is the controller of the exploration and finance company who is continually filling the press, or his listeners' ears, with gigantic, hazy, and unthought-out schemes for making millions; these men talk of amalgamations, sub-flotations, five hundred stamp batteries; but they could not describe a little mine with ore in sight to yield, say, £10,000 profit for ten years ahead: firstly, because they do not understand details, and, secondly, because their companies rarely contain an asset of such practical value.

Finance companies frequently earn the gratitude of shareholders by making large distributions of scrip which is intrinsically worthless.



RAILWAY MAKING IN RHODESIA.

Dishonesty in gold mining.

A great deal of dishonesty exists, and, I suppose, always has existed, in gold mining. Nowadays there are many mines which are really worked on their merits, but it is in financial matters, and share dealing, that the irregularities usually occur.

How the public is deceived

The public is heavily handicapped in its efforts to acquire correct mining information. The principal channel through which information reaches it is the financial press, and I have no hesitation in stating that the majority of financial papers frequently publish incorrect mining matter. These papers are subsidized by one or more of the big mining houses or groups, either by direct payment, or by periodical options on shares, or, most usually, by frequent and highly paid advertisements.

Whether it is wrong for a newspaper to puff the mine, or the man, whose advertisement it secures, I do not undertake to decide, but there is no doubt that the system is responsible for the circulation of an immense amount of incorrect information, and frequently causes the ruin of confiding persons who are guileless enough to believe these statements.

There is no necessity, I think, to unduly dwell on this unpleasant side of gold mining. So long as human nature stands at its present level, and the acquisition of gold remains the criterion of worldly success, so long will the mining industry continue to be the hunting-ground of unscrupulous men who will continue to use every known weapon for the furtherance of their unrighteous ends.

A summary of gold mining to-day.

Let us glance, in a brief survey of the gold mining industry of to-day, at the more favourable side of the question.

Transvaal.

In the Transvaal, now easily in the forefront of gold mining, there are about 120 mines that are either earning, or will before long earn, steady dividends: to these may be added a number of yet unfloated deep levels.

Rhodesia

In Rhodesia, development has not yet progressed to a great extent, but although the country is still an unimportant producer, prospects are distinctly encouraging for the near future.

Australia

In Australia, that wonderful and vast continent, which has yielded four hundred million pounds, sterling, of gold: from

Kalgoorlie to Charters Towers: from the Murchison to Bendigo and Ballarat: from Port Darwin to Croydon, and Gympie, and Lucknow, the whole continent is being explored for the precious yellow metal. All over this immense country, near the populous city, in the bush, in the heart of the Never-Never country, there are payable mines, and the energetic mining population of the great continent reaps yearly a rich reward.

Tasmania.

In Tasmania, several good gold mines are at work.

New Zealand.

In New Zealand there are great stretches of gold bearing reefs—only partially exploited as yet, and a few good mines. The colony has already yielded gold worth over fifty millions.

India.

In India there is one fine field, and several of the world's greatest mines are found here.

U.S.A., Canada, British Columbia.

The great gold industry of the States is exploited by its own people, who are past masters in mining matters; but in Canada and British Columbia there are many justifiable ventures for the honest employment of English capital.

Mexico, South America, Russia.

In Mexico: in South America: in Russia: much gold is being won. By these latter we benefit little. It is in South Africa, India, Canada, and Australasia—our own strongholds—that the greatest gold fields lie to-day, and it is in those countries that the successive scenes of this volume are laid.

No names of individuals mentioned:

I have, in writing this book, mentioned no persons by name. There are several reasons for this. Mining literature is usually so lavish of indiscriminate praise, that laudation of individuals is now written, and accepted, as a purely perfunctory practice, and carries no real meaning. In addition, this excessive advertisement is, to my mind, very vulgar, and can often be hardly acceptable—even to the recipient.

reasons for this.

Again, in these pages, occasionally, persons are alluded to in an uncomplimentary way: these individuals will, doubtless, excuse the omission of their names.

Value of mine managers,

But though I have cast a mantle of anonymity over individuals, I wish to specially mention the services rendered to the holder of gold shares by one class of men. The average mine manager, whether in South Africa, or India, or Australia, or wherever I have met him, is an extremely capable man. Of course, there are exceptions. Some managers are not capable: some are not even honest—but, as a rule, those in actual charge of our gold mines to-day are men who can be relied on.

The special knowledge required by these men has to be almost encyclopædic in its range, while a strong grasp of the springs of human nature, the knack of choosing good lieutenants, the exercise of great tact, and the ability to *govern*, are all necessary requirements.

To my mind, the most valuable essential of all in a mine manager, and that an attribute which is often subjected to a severe test, is honesty. I am pleased to think that I number as friends and acquaintances many mine managers all over the world, who *are* honest men, and who have, over and over again, to their own detriment, refused to do what they considered unworthy of their position as managers and gentlemen.

of mine captains,

of other officials.

But I do not wish to confine my praise to the managers only. The mine captain, whose valuable qualities are known more to the manager than to outsiders, is usually a most capable man, and devoted to his work. Many and many a time, after his hard day's work should have been over, has a mine captain cheerfully started off with me on a three or four hours' inspection of his workings, only too delighted to oblige, and asking merely that his visitor should show an intelligent interest in what he saw. To these men, and to the other heads of departments—to battery managers, cyanide works managers, assayers, samplers, surveyors, office staff, shareholders in every mine owe a debt which they do not realise, and which is often inadequately acknowledged. Amongst these men—I could give hundreds of examples—there is the greatest sense of duty to their employers, and from one year's end to another, by day and night, in the bush, on mountain tops, in fever swamps, in wild and deep places all over the world, they faithfully carry through their arduous work, and materially help to swell the golden stream that is ever pouring into London city.

A hurriedly written book.

This book, from its very nature, has had to be hurriedly written, and evidences of a certain uncouthness of style appear on many pages. But mining matters are continually subject to changes and permutations, and were I to delay its publication, in the higher interests of literature, for even a month, no doubt the prospects, or the financial details, of a dozen mines would, in the interval, have altered materially. I believe that most of what I have written, many of the facts, will be worthy of acceptance for two or three years to come, but after that much of the presently contained information will be completely out of date.

Outlines of policy of criticisms of mines.

I have been told that the general tone of my criticism of unproved, or doubtful mining ventures, is such that, were it acted upon, only dividend-paying mines would continue to work, and that exploration and prospecting, by means of which new mines are brought to light, would finally cease. My answer to this is that I would cheerfully see the public put up millions for the exploration of gold mines, or mineral districts, in almost any part of the world, provided I thought that the money would be honestly spent, and that the individuals who risked this money would not be deceived as to the results from its employment.

But, as it is, most of the money now furnished by the public for general exploratory work, or for mining enterprises which are not actually specified, is spent in an illegitimate and dishonest manner. The largest part goes regularly to vendors of worthless claims and properties, usually to the promoters themselves, while the balance is spent on dummy directors, and on all the up-to-date organisation of a mining corporation, with its fifty channels for extravagant and useless expenditure.

Were this not the case: were there the slightest chance that companies could be formed to explore and prospect for gold mines, the funds of which would all be honestly applied to the purpose in question, and in which the market rigging of the shares would not be preliminary to starting work, I would willingly advocate the formation of such companies by the hundred.

How to improve the industry: eliminate the London middleman.

But why should not an attempt be made in this direction? It would be worth a great deal to the gold-mining industry to eliminate the London middleman, who, I venture to say, is the curse of gold mining to-day. These men do not provide the capital to work the mines—they merely transfer the capital from the public, and in so doing keep the greater part for themselves.

Get rid of the middleman. Let small syndicates of speculators, who wish to go into mining for themselves, be formed, with the express object of getting into direct touch with the prospectors and their claims. These syndicates need not be located in London. Why should not the public in Glasgow, or Manchester, or Leeds, deal direct for a block of claims in Queensland or British Columbia? These syndicates must have no vendor's interest, no watered capital. They must be fair and square from their inception to the day when the property acquired is either abandoned or floated into a reasonably capitalised mining company, furnished by the members of the syndicate, with a substantial working capital. This, I think, is well worth consideration.

Experience creates an intuition in mining matters.

To one who is continually visiting mines, and, who, like myself, takes the greatest interest in their study, from both a mining and financial point of view, experience creates a sort of intuition, so that it is often possible to arrive at a correct solution of the particular problem even upon slender data, or after only a hurried inspection of the mine.

This statement may appear to embody the essence of empiricism, and might be subjected to severe criticism: I do not mean to say that my criticisms of mines, in this book, are so based, but I do state, unhesitatingly, that an intuition acquired by constant experience *can* be gained in mining matters, as in anything else, and that it can be most effectively used as one of the factors in the formation of a sound mining judgment—which, of course, is the acquirement, of all others, that a mining man must strive to obtain.

CHAPTER II.

THE DANGERS OF SPECULATION.

The selection of shares.

THERE are now so many good gold mines, and gold mining speculations, in different parts of the world, that those who buy mining shares are in a position to show far more discrimination than they could formerly. That is to say, they are in a position to do so, provided that they observe certain well-known precautions, which those who are in the inner circle of mining affairs have learned to do, and which I will endeavour to enumerate.

The gambling mania

To begin with, it may be said that three-quarters of all transactions in mining shares come under the head of gambling, pure and simple. The average gambler in mines cares nothing for the intrinsic value of a property; he does not study its past history, he does not intend to hold the shares for dividends—in fact, he wants to know nothing about the mine. All he asks for is a large profit on his speculation in a minimum period, and, credulous and greedy as he is, jumps eagerly at the first source of information that comes to his hand. The company promoter, and his myrmidons, who, in their turn, control a large section of the financial press, have, in these days, effected an organisation for the fleecing of these thousands of greedy, credulous gamblers, which is not only complete, but marvellously successful.

is taken full advantage of by the promoter.

A prospectus

The promoter forms a company: he issues a prospectus in flowery language, and to it attaches the report of a dishonest expert, or the report of an honest one with the unfavourable points left out: he prints off, for himself or his syndicate, 100,000 or 200,000 shares: he advertises the company by circular, or in the press by paragraphs which are paid for at ten times the rate of

Press paragraphs.

Allotment.

ordinary advertisements. If the mining market is strong, or if his company has been cleverly advertised, the shares which are to provide the vendor's proportion of cash, and the small working capital, are all applied for: if the market is indifferent they are only partly applied for—in any case the company proceeds to allotment. Here we pause for a moment, to inspect the share register of the newly formed company. We note that the names of the hundred or two hundred proud possessors of the allotted shares are those of respectable proprietors or shopkeepers in the provinces: of gullible women: of retired officers: of even a curate or two: and of, at least, 25 orphans. But we note with a feeling of due respect that the name of not a single man who is reputed to be "in the know" of the mining world, is included.

How to detect a worthless flotation.

Working capital.

Directors.

But the principal facts that have kept mining men of experience from taking shares in a company of this nature, are facts that are at the disposal of all. To begin with, assuming that neither the flowery language of the promoters, nor the hollowness of the report, nor the evil reputation of the expert who penned it, can be expected to show themselves to the scrutiny of the most ignorant class of speculator, the smallness of the working capital asked for *must* betray the nature of the undertaking. Everybody knows that a mine cannot be started for £15,000—the sum we will assume as being provided—nor, indeed, very often for £150,000. Then, again, the list of directors who are to have control of what is assumed to be an important mining company, a concern which needs the application to it of great financial training and acuteness, to say nothing of experience, presents rather a ludicrous appearance. There is a lord, a general, an M.P., a knight, and two untitled men (or some permutation of the above), but not the name of a single well-known business man, nor that of a director connected with any successful mine. All of these directors may be honest and willing men, but it is only too evident that they utterly lack the necessary qualifications for their office: that they are merely the dummies or decoy ducks of the promoter (who, we assume, in this particular instance, to be dishonest) and that, for their directors' fees, they cheerfully undertake the responsibility of successfully bringing to a profitable stage a mine which is hopelessly short of working capital. Now, already, we have noted points which, if carefully studied and acted on, would result in the collapse *before* flotation, of half the so-called gold mines that are now in existence.

But we must return to the promoter.

Promoter "pools" shares

The company has gone to allotment. This fact, together with an appreciative paragraph concerning the company, paid for as before indicated, appears in next day's papers all over the country. Simultaneously an announcement is made that a Stock Exchange quotation for the shares has been applied for, and, as if to show the immediate recognition which the shares have gained in the financial world, a tape quotation appears showing them to be standing at one-eighth premium. As every share in the company, except those which have cost the applicants £1, is *pooled*, and lying securely in the safe of the promoter, and as the promoter knows that the people who applied for shares at £1 did so with the object of making at least 100 per cent. profit, it is a matter of the greatest ease for him to regulate the quotation up to any figure, so long as it does not bring these people as sellers into the market. Although there is little likelihood that any of the shareholders will sell their newly acquired shares at a profit of a few shillings, and so spoil his market quotation, the promoter makes doubly certain by the introduction, in certain papers, of carefully worded little paragraphs congratulating the shareholders on the fine prospects in store for them, and advising a still further purchase of the shares at a premium.

and "rigs" market.

Tape quotations.

Simultaneously the shares are quoted on the tape at 25s. These announcements, together with the rapid, though not *too* rapid, rise of the shares on the market, bring in quite a number of new purchasers, who are now supplied from the promoter's safe, while the original, and now flattered, shareholders are more than ever resolved not to sell under £2. A week later, the shares reach 30s. Those who have bought their shares at less than this casually mention their success to their friends, and the latter eagerly wire to their London brokers for 100, 500, or 1,000 shares. The pile of scrip in the promoter's safe is now considerably lightened, and, to say nothing of the cash which he probably received on flotation, he and his partners in the concern have all netted a large profit. The history of the mine, from this period onwards, need not be described. The promoter clique never expects to get rid of the whole of its shares, but it occasionally manages to do so. An ignorant or a dishonest manager is put in charge of the property. If he searches carefully, he can nearly always discover some small bits of stone containing visible gold. Some of these are assayed, and the results, which, of course, are high, telegraphed to London: the remainder are shipped home to be exhibited to admiring shareholders. If interest can only be sustained in the doings of the company, and the general mining market continues good, few shares will come on the market. The directors announce that, acting on the manager's advice, a large battery has been ordered, and is in course of erection: this has a distinctly good effect on the shares. But in order to pay for all this machinery, the development of the mine is stopped. When milling commences the first week or two is sufficient to crush all the picked ore that has been set aside. It is found that the rest is quite unpayable, and as the company has no more cash to fall back on, the mine has to be shut down. This does not affect the promoter clique, but it is an unpleasant occurrence for the manager, and the directors, whose salary and fees depend on the existence of the company. The manager recommends that the "highly promising" prospects of the mine be done justice to, in the shape of further development, and the directors enclose his report in an eloquent appeal of their own for reconstruction. This may be carried: some mines have been reconstructed oftener than once, but we are not at present concerned with what the shareholders may decide to do. They have lost once—heavily: the shares are unsaleable. And, yet, the whole fiasco might easily have been prevented by the use of a little common sense.

Off-loads scrip.

False assays are published.

A mill is ordered,

but there is no payable ore.

Reconstruction.

How to avoid the dishonest flotations.

We have already noted that people who are successful in mining, and there are not a few, do not go into mines of which the prospectus is uncertain, the directors dummies, and the working capital absurdly insufficient. Neither do they believe in newspaper paragraphs: they know that shares can be, and are frequently, *pooled*, and that, therefore, being subject to the manipulation of one man only, they can be raised just as quickly or as slowly as the operator wishes. To them tape quotations for shares of this description carry no meaning: lastly, and perhaps most important of all, should they, for reasons of their own, buy or subscribe for shares of this sort, they take immediate advantage of any rise in the price to quickly and expeditiously clear them all out, while the less experienced, having sown *their* seed, await with eagerness the fruition, which they have variously estimated at, some thirty, some sixty, and some an hundredfold. These mines, then, are gambles: their share certificates are equivalent to lottery tickets: through their agency a colony of company promoters and their cliques, resident in London, prey upon the savings of the nation, and it is largely owing to their instrumentality and machinations that the legitimate and splendid gold-mining industry has come to stink in the nostrils of so many thousands of people.

500 worthless mines recently floated in London.

I could with ease give the names of 500 gold mines floated during the last few years in London alone, which come under the foregoing classification.

Good mines are not offered to the public except at a high premium.

Another important point for the great speculating public to remember is, that no mine with proved or really promising prospects is ever offered on the market except at a high premium. It is well known that the valuable deep level areas at the Rand, which were known to carry payable gold before operations were ever commenced on them, were never offered to the public as were the outcrop mines. Their owners themselves were quite content to furnish the enormous sums required for their development, and it was only at a premium of from £2 to £10 per share that the public was afterwards offered an interest. Whether a mine is in Polynesia or Peru, so long as it can show payable ore, and good prospects, it will never come before the public in the ordinary

An example of this.

manner. Take a case in West Australia. Not long ago, when the market was depressed, and the public thoroughly disgusted with that colony, a new mine, the Sons of Gwalia, was brought out. It had a large capital, and a large sum was set aside for working capital. But it was all subscribed privately, and the shares only appeared on the market at £2 each. The reason for this was the fact that a large quantity of payable ore was in sight, and the prospects of the mine were very favourable. In any case the public was not asked to participate, except at 100 per cent. premium. Shortly afterwards, the Star of Gwalia was advertised. This mine had no payable ore in sight. Indeed it is located at some distance from the rich patch of the good mine, and may never have any payable ore at all. In this case the vendors allowed the public to participate at par, and were only too glad to do so, although no doubt their action, after the high-handed behaviour of the controllers of the neighbouring mine, appeared to be particularly generous.

The public is greatly to blame as well as the promoter.

While pointing out the havoc wrought by the unscrupulous promoter, it is only fair that the public should realise how seriously it is to blame as well. In the race for riches: for profits of 100 per cent.: or even for the excitement to be gained by speculation, the public simply plays into the hands of the promoter. In talking or writing of the South African, Westralian, or New Zealand collapses, the sufferers are too much commiserated at the expense of the gainers. In reality both deserve the censure of common sense: the promoters, because of their efforts, in the press and elsewhere, to *deceive*: the sufferers, because of their undue gullibility, and because of their greed in so far that they frequently refused to be satisfied with a good profit when there were hundreds of greater fools than themselves, ready to take over their shares with all risk attached to them. In any case, it can do little good discussing the past: it is quite possible, however, to lay down maxims for the conduct of mining and financial operations in the present and future, and if the writer, in the following paragraphs, is able to offer any advice which shall prove of assistance to any doubting shareholder, he will feel amply rewarded.

How to estimate future flotations:

Firstly, then, advice to those who subscribe to gold-mining companies that may be brought out hereafter:—

the prospectus;

Do not be guided by the prospectus, which consists of a string of eloquently worded inanities. Do not believe the report of the expert which is usually attached to the prospectus, unless it is that of a man well known, of admittedly honest character, or, in the case of a stranger, unless the said report will bear the careful scrutiny of yourself and of such of your friends as may be experienced in mining.

the report.

The directors' titles.

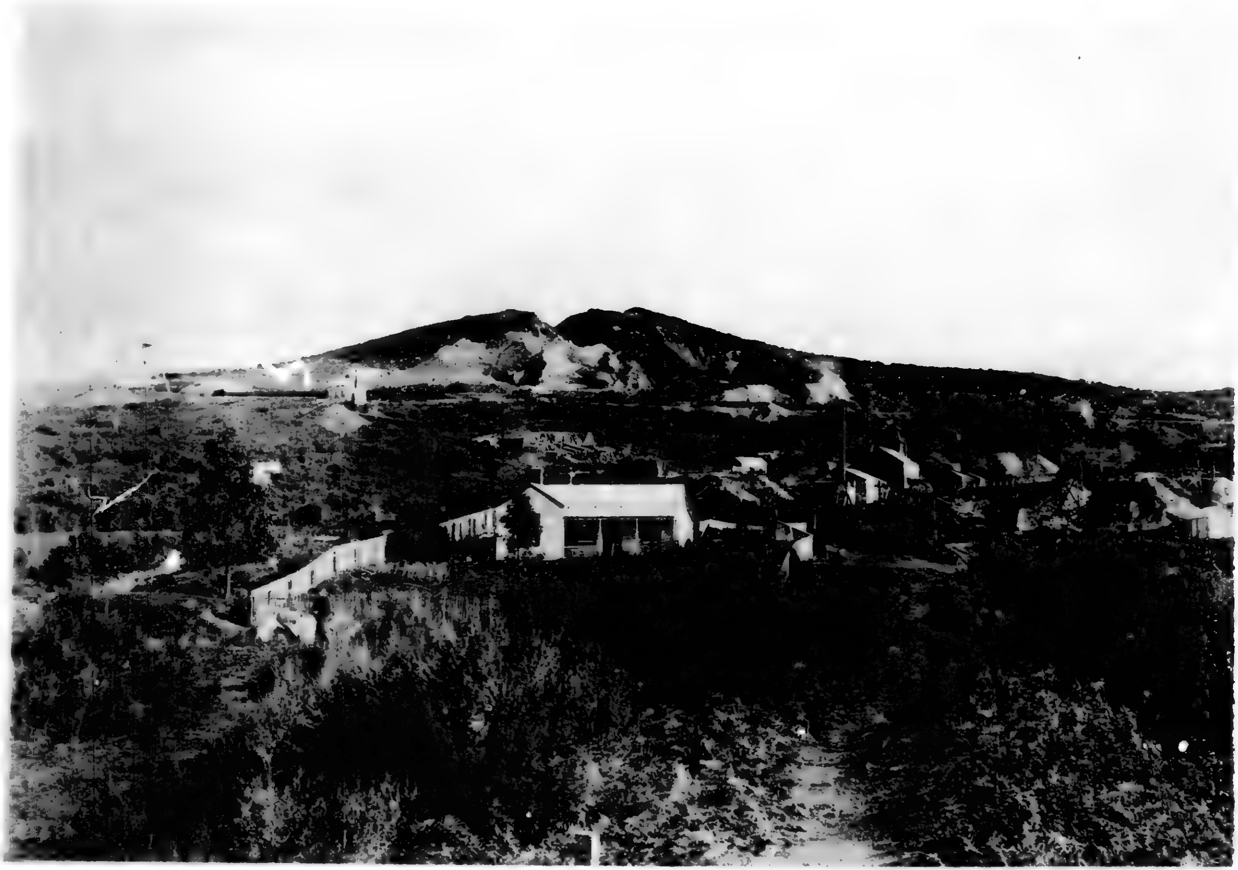
Do not judge the capacity of the directors for conducting such an important concern as a gold mine, by their titles. The names looked for should be those of well-known business or commercial men in London or elsewhere: of directors in successful mines: of mining engineers, or the partners in well-known mining houses: and, most of all, the real magnates in the mining world, who will take care that their names shall not be mixed up, in a directorial capacity, with any company likely to be a failure.

The working capital.

Do not for a moment consider the advisability of taking shares in a mine which is not provided from the start with sufficient working capital. The smallest amount of working capital asked for must be £30,000 in the case of a speculative venture, and £50,000 when anything specific or definite is undertaken, such as sinking a deep level shaft, or driving a tunnel to locate the continuation of any reef. This sum must be in *cash*, not in the shape of half cash, half reserve shares. It must be clearly understood that no mine can be developed and equipped on a sound scale for £50,000. This sum is to be devoted to development only. If results are favourable a further large amount still remains to be provided by the shareholders.

The vendor's interest.

Do not favourably consider a scheme in which the vendors propose to annex 60 or 80 per cent. of the shares. As a rule, the unproved ground which is usually floated as a mine has only cost the vendors the price of pegging out and surveying, or at most £1,000. If the company in which you have applied for shares



WAIHI MINE.

The allotment.

goes to allotment, make it your business to find out how much of the working capital stipulated for has actually been subscribed.

The press "puffs."

Do not, in the early days of a mine's existence, believe what newspapers or printed circulars say as to its success. It takes many months to prove a mine.

The tape quotation.

Do not, assuming that all the vendor shares are *pooled*, and that the market is being worked by one man, believe in the genuineness of tape, or Stock Exchange quotations.

The profit taking.

Finally, and most important of all:—Be satisfied with a reasonable or even a small profit. When you decide to sell do not give your brokers a limit, slightly above that at which the shares then stand, but sell immediately, and right out.

Apply system to speculation and wild cats disappear.

Thus should the novice, or the speculator who has no accurate sources of information, conduct his gold-mining operations, at least when dealing with new and unproved mines. If everyone were to follow the rules laid down above, only about 20 per cent. of the mines now floated would have proceeded to allotment. Even then, of course, the speculator could not assure himself against loss, but he would greatly minimise the risk, and at the same time would have the satisfaction of dealing with the business in a common sense, and perhaps profitable manner.

Secondly, with regard to mines that are already floated, but in a doubtful condition, a few remarks may be profitably studied.

As to mines in a doubtful condition.

In this connection, I should like, from considerable experience of the subject, to suggest a number of points on which the directors of unproved or doubtful mines should instruct managers. This is information which should be of considerable practical value, not only to shareholders, but to directors of such companies, and its application to the conduct of operations at the mines, would, if it did not actually result in any of them being proved payable, at least relieve such companies from the stigma of mismanagement and extravagance.

Selection of manager:

To begin with, whether a mine is payable or worthless, a manager has to be selected. A good man, with a good record, especially a trained mining engineer, cannot be secured for the small salary which ignorant bodies of directors insist on offering to their managers, and the natural consequence is that an unsuitable man, frequently some novice who is a friend of one of the directors, is secured.

his duties;

A trained mining engineer is not absolutely necessary to the ultimate success of a mine, but an experienced man most certainly is. To begin with, the property has to be surveyed, shafts have to be laid out, and their timbering designed. Winding gears and pumps must be ordered. A thorough knowledge of the mining laws of the country, and of accounts, is imperative. Then comes the most important point of all. The ore has to be sampled from the commencement, and on the results of this delicate operation the decision of the manager as to the whole future of the undertaking must be based. Here the most level-headed experienced man, one with the soundest judgment and strictest integrity, is necessary to the success of the company. If the ore is found to be quite unpayable, and the reef itself not of a permanent nature, it would be his duty to inform the directors, without reservation, and to recommend the closing down of the mine. If the directors insisted on continuing work, a manager with a name to keep good would resign. If, on the other hand, the ore proved unpayable, but was lying in a favourable formation, and in the neighbourhood of a payable mine, the manager's duty would be to inform the directors that in all probability the mine would be a failure, but at the same time, to recommend further mine development. If, in the third and last case, the ore when sampled were found to be low grade, but probably sufficiently good to pay if worked on a large scale, the manager has a distinctly difficult task before him. He must lay the case fully before the directors, and recommend the further development of the mine, at the same time planning to expend all the company's funds in mine development, except on such machinery as may be absolutely necessary.

honesty his great essential.

The manager's honesty and strength of character is generally severely tested by the action of directors.

At once a cable, or letters, will arrive from the board, stating their wish, on the promising appearance of the mine, to erect a battery, and asking him to recommend such a course. Now comes the test of the manager's capacity and strength of character.

If he is weak, and anxious to keep his place secure under all circumstances, he will comply with the Board's wish, and be the means of ruining a mine. If he is a strong and capable man he will realise, first of all, that the mine is not sufficiently developed for him even to be certain that it will pay: that the company's funds are not sufficient for the full development of the mine—let alone for the erection of a battery: and that, finally, the directors, the dummies of the promoter, are guided in their desire, not by the interest they feel in the mine, but very often, by the interest which the controlling clique feels in the share market. The manager *must* realise that the course proposed is, in his completer knowledge of the subject, the worst course for shareholders, therefore it is his duty to firmly refuse to recommend the premature erection of a battery and other needless machinery, and to resign if still commanded to do so. But how many managers of poor or undeveloped mines can be found to take such a course? They are often inexperienced men: placed by circumstances in a position higher than they have been accustomed to: frequently the friend or nominee of the vendor himself—showing the utter fatuousness of the directors: quite incapable of either sampling a mine correctly, or framing a policy on the result of such sampling: most of all, incapable of carrying such a policy through. Such men hardly have opinions of their own: the directors' slightest suggestion is law. If they know that they are expected to cable home good assays, they do so, whether the ore assayed is found on their own property or elsewhere. If it is gently intimated to them that the ordering of a battery would have a cheering effect on the shareholders, the battery is at once ordered. Servility to the interests of the promoter clique is their motto. A man of this class clings to the mine and his salary to the very last, and, consequently, often years pass after the flotation of a mine before anyone has the slightest idea of its real value. At last the directors are forced to action by the disappointed shareholders: a well-known reliable mining engineer reports on the mine; it is found to be worthless, and is liquidated, but after the spending of many thousands of pounds that could have been saved and

What a manager of a poor or doubtful mine, if a man of weak character, is generally led to do,

and the results.

returned to the shareholders, had the company only possessed from the beginning an experienced, honest, and *highly paid* manager.

A system in such matters.

Now here is a mode of procedure for the conduct of operations, which should be studied by the shareholders, and more especially by the directors, in already floated mines which are so far unproved, or are in an unpayable or doubtful condition.

Manager's qualifications

Firstly :—The manager appointed must, if possible, be a trained mining engineer, but, if not that, at least a man of experience, accustomed to control, and entitled to ask, and to receive, a minimum salary of £800 a year; a first-rate man would expect £2,000 a year, at least, but he would not take up the management unless the mine was a really promising venture. The manager appointed must in no way be connected with the vendor, and his past record must be carefully scrutinised. It is a great mistake to postpone the selection of a highly paid manager until the mine is proved payable. An ignorant man or one who allows the directors to dictate to him on technical questions, will cost the company thousands of pounds, and will never be able to gauge the exact value of the ore.

and salary.

Directors' instructions to manager.

Secondly :—A manager having been appointed, the directors' policy towards him must be laid down. He must be told that all the working capital of the company is to be spent in mine development only. The manager at the commencement of developing the mine, is to engage the best assayer and ore sampler that can be found, and an assay office, built to the plans of this official, is to be erected. The mine is to be sampled every five feet, the results are to be reduced to a full stoping width, and a duplicate of the assay plan is to be sent, from time to time, to the London office.

Course to be adopted if mine appears to be payable.

If the ore opened out after a year's development, or up to the time when the originally provided working capital of the company is becoming exhausted, is of good quality, there is no doubt but that the shareholders will authorise the directors to engage the services of a well-known engineer to report on the mine. Should he confirm the manager's favourable opinion, and the tale told by the assay plan, there is no doubt but that further working capital could easily be raised. This, if results were still doubtful, would probably be a small amount, and would only be devoted to further opening out of ore. But if the results were really good, a large sum of money should be raised: then tram lines and water races could be constructed, and the erection of workshops, air compressors, a battery, and such like would be undertaken. By this method, system would be introduced: a regular procedure in all similar undertakings would be brought about: and the public would feel that honesty and confidence were being restored to the mining industry.

How to spend the working capital

if the mine is a failure.

If the mine is a failure, and shareholders are in a position to find this out from the assay plan, as well as from the manager's reports, the company should be liquidated. As I have said there are many opposing interests against such a course. The promoter will no longer be able to manipulate the market, or to make fictitious quotations for the "*pooled*" shares, the directors will lose their fees, and (in the case of dishonest directors) their commissions: the manager his salary. This matter largely rests with the manager. If he is a dishonest man, and in collusion with the promoter clique, he will recommend that the mine is good enough to warrant reconstruction—thus retaining his salary, and a continuance of his patrons' manipulations: if he is honest, he will recommend that the company be liquidated, and, what is more, will insist that a copy of his report, on so vital a subject, be placed verbatim in the hands of each shareholder. I think I have said elsewhere, and I now repeat the statement, that the manager of a gold mine is of infinitely more importance to the success of the company than all the directors put together. His honesty and integrity of purpose towards the shareholders, although he is nominally the servant of the directors, must be unquestioned, and the securing of a strong man, one who, if occasion requires, in the cause of right, will make himself heard beyond the walls of the board room, must be the first consideration for every mining company.

Shareholders must look to their interests,

and must insist on receiving the manager's reports verbatim.

The manager is the shareholders' greatest safeguard.

Provided he carries out all the board's policy, and possesses its confidence, the manager should be allowed entire control of all technical matters and of all expenditure. He should have full power to order his own machinery, stores, and such like, and, I think, might be trusted to effect a better bargain than many present day directors, fat rich men, most of them, who themselves insist on purchasing the company's requirements, receiving commissions all round.

CHAPTER III.

THE GOLD MINES OF THE TRANSVAAL.

Early gold discoveries.

Pilgrim's Rest.

Mac-Mac.

In 1870, prospectors in the northern district of Zoutpansberg were the first to discover gold in the Transvaal. In the following year, the discovery of the alluvial fields at Pilgrim's Rest, and Mac-Mac, in the mountains of Lydenburg, led to a big rush from all parts of the world, and from that period onwards the South African Republic was included among gold-producing countries.

Moodie's.

Barberton.

1886: discoveries of banket.

About 1884, reef gold was discovered in a number of places on Moodie's Mountain, and on the adjoining hills of the De Kaap range, and a new quartz mining field, with Barberton as its centre, sprang into existence. From that time to the present the Transvaal and its mines have always held the public attention. From 1886 onwards a series of discoveries, principally of "banket," or reefs of water-laid pebble formation, was made: Witwatersrand, Klerksdorp, Potchefstroom, and Heidelberg districts were all found to contain banket beds, and explorers later on opened up the quartz reefs of the Murchison and Klein Letaba districts, and the stratified veins of Lydenburg. Less important finds were made, too, in the New Republic and Swazieland—now parts of the Transvaal—and at Malmani and Otto's Hoop on the Bechuanaland border.

The Rand.

But long ere this, all these outside districts have had to give way in importance to the gold field of Witwatersrand—a series of banket beds nearly forty miles in length; unlimited, apparently, in depth; and payable over the greater part of the entire area.

Witwatersrand, with the fine city of Johannesburg as its centre, although only thirteen years old, has long ago taken the position of the leading gold-mining centre in the world, and from its own immediate neighbourhood now turns out more gold than the United States or the whole of Australasia.

Total yield from the Rand.

The yield of gold from the Rand, from the commencement till the end of 1898, totals £64,278.199, and is made up as follows:

1887	£81,022
1888	726,821
1889	1,300,509
1890	1,735,491
1891	2,556,328
1892	4,297,610
1893	5,187,206
1894	6,963,100
1895	7,840,779
1896	7,864,341
1897	10,583,616
1898	15,141,376

Future yield.

For a number of years to come an average yield of £22,000,000 may be confidently expected, and it is certain that there is ore in sight to ensure a large output for thirty years more.

There is no need to enter into details about the geology of the Rand banket beds. The fact remains that the gold is there, and when any two geologists are prepared to agree as to the source whence it came, it will be soon enough for laymen to study the question. In a description of the deep level mines, which occurs later in this chapter, I have summarised in a popular form, some of the elementary geological features about the banket beds, but I pretend to no originality on the subject, and am myself inclined to prefer dividend tables to abstruse geological speculations.

Importance of Johannesburg compared with other mining centres.

Witwatersrand to-day, is probably a greater gold field, to the extent of 85 per cent., than any other individual district in the world. I would place Kalgoorlie, West Australia, as second, but at this great distance behind the Rand, while other fields I have visited, Coolgardie, Bendigo, Ballarat, Charters Towers, Ohinemuri, Kolar, and Rossland, though fine fields, are of still less individual importance.

156 mines on the Rand.

At the time of writing this, there are on the Rand 156 mining companies, while a number more, chiefly to work deep level areas, are in course of formation.

Of these 156 mines, 124 are situated on the Main Reef banket beds, and the great majority of the latter will eventually be worked at a profit.

In 1898, 75 mines working on the Rand produced gold to the value of £15,141,376, and of these 40 paid dividends equal to £4,834,158.

Results and dividends for 1898.

In 1898, the following dividends, earned from actual mining, were paid by mines on the Rand:—

Robinson	£440,000
Geldenhuis Estate	295,000
Crown Reef	288,000
Ferreira	270,000
Geldenhuis Deep	225,000
Village Main Reef	210,000
City and Suburban	204,000
Bonanza	200,000
Rose Deep	170,000
New Primrose	165,000
Simmer and Jack	164,500
Henry Nourse	156,250
Crown Deep	150,000
Pioneer	141,750
Langlaagte Estate	141,000
Angelo	137,174
Glencairn	125,000
Wemmer	120,000
Heriot	111,864
Durban Roodepoort	100,000
Witwatersrand	97,500
Wolhuter	86,000
Treasury	81,000
Jumpers	80,000
Rietfontein "A"	71,437
Driefontein	68,750
Ginsberg	64,000
United Roodepoort	60,000
Worcester	57,433
Meyer and Charlton	51,000
Jubilee	50,000
Porges Randfontein	48,750
Langlaagte Block "B"	47,850
May Consolidated	41,250
Lancaster	30,000
New Comet	28,125
Kleinfontein	23,125
Windsor	20,000
Salisbury	10,000
Stanhope	3,400
	£4,834,158

Total debt of Rand mines.

The combined debt, in debentures or otherwise, of Rand mining companies amounts to £5,516,000.

Further capital will have to be provided, in order to bring all the already floated promising mines to a producing stage, to the amount of £12,780,000.

A main reef mine is a commercial undertaking.

An average main reef mining venture is a perfectly legitimate undertaking in every respect, and does not offer greater risk to the investor than a sound commercial undertaking of any other nature. But there is a limit to the value of a mine such as this, which the public, in receipt year after year of regular dividends, has never fully realised. The mine becomes worked out; the redemption of capital invested becomes every year a more pressing necessity; and, yet, such appears to be the ignorance of the public on this point, that the share market may be said to practically ignore the question of redemption altogether.

To speculate to-day on the Rand, or in Rand mining shares, both a scientifically inclined mind, and a great deal of rule of thumb, are necessary.

Investors must study local conditions.

The investor must know which are the good localities, and which are the best financial houses to follow. He must be up in claim areas, stamping capacity of the mills, lives of mines, and allow adequately for redemption of capital invested; he must thoroughly understand all about deep levels, ore sorting, the water supply, the state of the native labour market, and the use of rock drills in stopes.

Finally, he must learn to sell his shares—be they speculative rubbish or gilt-edged investments—during the periodical "booms," or strong markets, which always come sooner or later, and he must devote the proceeds to buying into well-selected and well-controlled mines during the reactions which inevitably follow.

I have little that is new to say about the Rand and its mines; the subject has been dealt with already from every conceivable point of view, but I will try to make the foregoing points as clear as possible.

The political question.

Firstly, there is the eternal political question. To my mind the grievances of each party—Boer and Uitlander—seem evenly balanced, and I will try to sum up these grievances as they appear to exist.

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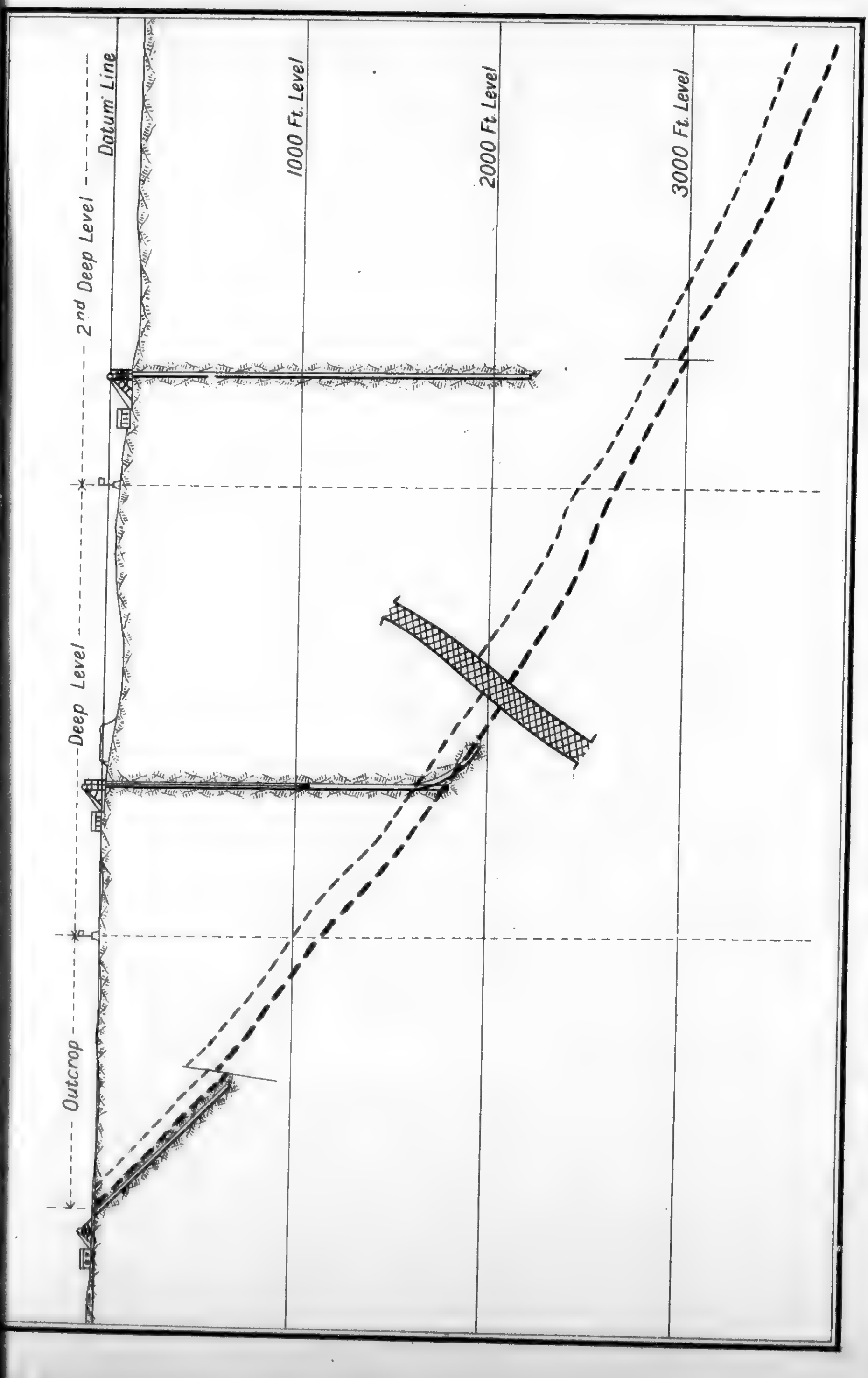

A SECTION THROUGH THE MAIN REEF SERIES.

Misgovernment by the Boers.

The Boer Government has always viewed the mining industry with suspicion, if not with hatred, and has continually brought unfair legislation to bear upon it. The laws relating to native labour, liquor supply, and such like, have been placed in the hands of a civil service utterly unable to administer them.

Monopolies have been created in such important matters as railway transport, the manufacture and supply of dynamite and other explosives, and in other articles of prime necessity to the community and mining industry. Moreover, the food supply is heavily taxed. On the head of this has come the 5 per cent. tax levied on mining profits, and it is feared that this tax will be increased from time to time whenever the Government requires more money.

Unjust taxation.

There is a terrible squandering of revenue every year by the Government, often in a reprehensible manner; the Uitlanders assert, and with justice, that were the finances of the State spent in a proper manner, the natural revenue would be more than sufficient for all requirements.

In addition, there are only too many authentic cases of Boer legislators and officials selling their services and influence, and the Government in all its departments is viewed, largely for this reason, with intense distrust.

The case for the Boers.

Now what can be said of the Boer side of the question? From the early days of the Rand, every Boer in an official position has been subjected, by one or other section of the Uitlanders, to a course of bribery. Impecunious, weak-willed, uneducated people as they are, is it surprising that they have fallen?

Again, the Transvaal is the richest mining country in the world; hundreds, yes, thousands, of the Uitlanders, as well as shareholders in Europe, have made fortunes out of its gold mines, and many of those who have thus benefitted have never seen the country, and all the richest men among the Uitlanders leave it as soon as they can: it is evident that but a few have come voluntarily to stay.

The Uitlanders demand the franchise, and, as they are in the majority, this is equivalent, in the Boer mind, to demanding the government of the country. Of this vexed question, although I have studied it for years, I can offer no solution. Granted that the present Government is thoroughly bad—would a new Republican Government, with a controlling Uitlander influence, be any better? Critics must not forget that many of the best men in the Transvaal to-day would not become naturalised burghers of the country, and that the political vote would pass largely into the hands of Germans, Polish Jews (who would control the liquor interests), Cape Afrikanders, with ideals of their own, and perhaps British miners, who would be engrossed in purely labour questions.

In praise of the Transvaal.

I confess that, as a Republic, I see little hope for a well-governed Transvaal, but as I have said before, I do not pretend to offer a solution of this question, and I do not wish to appear adverse to the political aspirations of the thousands in the country who have been used to the standards of honest English government. But, setting politics aside, residence in the Transvaal is no great hardship. Even without the nominal control of the government of the country, I say it advisedly, we, the Uitlanders, are in an equally good or better position than the residents of any other gold field in the world. There is a perfect climate in the Transvaal. There is unbounded wealth for those with capital at their disposal, and a high wage for those willing to work. There are practically no official or governmental restrictions in private and social life. There are periodical "booms" in the share market, engineered in Europe, by means of which any man with brains and a small capital, who is not a gambler pure and simple, can make a good deal of money. Lastly, extraordinary paradox though it may seem, the real government of the country is in our hands. We own the Rand: we own a half of the whole State: our capitalists have established excellent private relations with many of the Government officials: the President and other prominent Boers own gold-bearing farms, which it is their wish to get explored, and, if found good enough, floated; and the all-powerful love of money-making permeates the whole community, and brings the sensible Boer and Briton into the most harmonious relationships.

A few more years will see the government of the country, and that with the consent and co-operation of the Boers themselves, pass into the hands of more enlightened and progressive rulers. Surely the exercise of patience in the meantime by the

Uitlanders, the real dominant race, is no great hardship. As a class we have never used tact in our treatment of the Boers. It is not too late to begin, and there is no reason, even at this late hour, why permanently better relations, which would redound to our credit, and which would bring about a better state of feeling all over South Africa, should not be established.

Principal political questions.

The main questions now at issue between the Government and the mining industry, exclusive of the franchise, are those of

(1.) General questions of taxation—including monopolies.

(2.) Administration of the Pass Law and Liquor Law—as affecting the native labourers.

(3.) Bewaarplaatsen.

Taxation

(1.) As regards taxation, it is a cause for regret that there has not from the first been in the Transvaal a direct tax on mining profits. In all the English colonies there is a tax of 5 per cent. on dividends. In Mysore, India, there is a tax of 5 per cent. on the gross output, and in the English Presidencies the tax is $7\frac{1}{2}$ per cent. But in the Transvaal neither has there been a direct tax levied, nor had even the early passed law that the Government may levy $2\frac{1}{2}$ per cent. on the gross output from mynpachts ever been enforced until recently. Had the Government from the early days been in the receipt of, say, half-a-million annually from direct taxation of the mining industry, it is more than probable that all the dissatisfaction caused by its ever-recurring want of money, by its unjust policy of monopoly-giving, and by its recent enactment of a 5 per cent. tax, would have been greatly obviated, and the State would have existed under a regime of comparatively sound finance. As it is, the mining industry is taxed, indirectly, to a most unjust degree. But the State does not benefit. The taxes do not go into the coffers of the State, but into those of the Dynamite Company, the Netherlands Railway, and of the Cape and Natal Government Railways (which wisely follow the example given them by the monopolist company of the Transvaal); and into the pockets of innumerable individuals and concessionaires who fatten upon the Government, and who are responsible for an immense State expenditure which is entirely unjustifiable.

should be readjusted.

There is no doubt that the whole political situation hinges upon the adjustment of taxation. An income tax should be brought in, and a direct tax of 7½ or even 10 per cent. on profits should be levied. Against this, the Netherlands Railway should be expropriated and worked as a State Railway; the dynamite monopoly and other concessions should be bought out; the duties on food should be abolished. The Transvaal, with its wonderful mineral resources, might then become one of the soundest countries in the world financially, and the Government would have enough money for all legitimate requirements.

Civil Service administration.

(2.) The administration of the Civil Service, or rather the lack of administration, has caused more trouble to the mining industry than the unjust taxation itself. This specially applies to the laws regulating the contracts between native labourers and the companies, and those which provide for the restrictions against the sale to the natives of strong drink. The laws on these subjects are quite sound—but they are never carried out. It is, apparently, possible to bribe a majority of the petty officials who administer these laws, and the result is, literally, chaos.

Pass law.

Natives by law are not allowed to break contracts with the companies that employ them. As a matter of fact, thousands of natives, to secure whose services the mines spend enormous sums, desert from any given mine during a year, and not 5 per cent. are returned by the officials whose duty it is to prevent this.

Liquor law.

Natives are not allowed to buy drink. In practice, it is found that from 10 to 25 per cent. of the natives on every mine are continually incapacitated—from drinking the vile liquor supplied by the hundreds of Polish Jews whose canteens swarm all along the reef—and the expense to the mines from this source is very great. A satisfactory administration of the existing laws which refer to native labourers would do an immense amount of good.

Bewaarplaatsen.

(3.) The Bewaarplaatsen question refers to those areas, equal to about 500 claims in extent, which some mines originally took up as sites for machinery and tailings, or for water rights, and which now, owing to deep level developments, have become very valuable. For years past the companies interested have petitioned the Government to give them full mining title to these claims, but the Government has continually postponed a decision on the subject. There is no reason to think that this question will not be satisfactorily settled eventually. The claims mostly lie in small blocks, containing the reef at great depth, and it would be impossible for new owners who might acquire the mining rights of these claims to work them at a profit: again, the surface rights belong to the mining companies, so that a new set of owners could under no circumstances reach the reef, however valuable it might be, except by arrangement with the mines themselves.

Will probably be settled satisfactorily.

The solution of the question is clearly this: that the Government should offer the claims, with full mining title, or bezitrecht, as it is called, to the companies interested, for from a third to a half of their estimated value. Should the companies refuse to take the claims on these terms, they should be put up to auction and sold to the highest bidder.

Native labour, the most important question of all.

The next problem to be discussed, the most important of all to my mind, is that of native labour. It is more pressing than dynamite, or railway tariffs, or a 5 per cent. tax, and, when combined with the political side of the same question, viz., the administration of the Pass and Liquor Laws, is of supreme importance.

For years past there has never been a full supply of natives on the Rand, and considering the large number of big mines, with batteries of 100 and 200 stamps, which have recently commenced work, it is really extraordinary that the supply has kept up so well.

Sources of supply.

The sources of supply are :—

(1.) Natives of Swazieland, Zululand, and Natal. These are fine workers, but can rarely be induced to work underground.

(2.) Natives of Basutoland, Cape Colony, and Bechuanaland. They are capricious, and form only a small part of the supply.

(3.) Natives of the northern districts of the Transvaal. They are inferior workers, and also much interfered with, on their way to and from the Rand by Boer farmers—who require labourers—and petty officials, who, under pretext of their position, frequently extort money from the natives, and frighten them away most effectually.

(4.) Natives of the Portuguese provinces in Mozambique. This is by far the most important source of supply. The men are excellent workmen, especially underground; they stay on the field for a considerable period, and, except when under the influence of drink, or of periodical tribal excitement, give every satisfaction.

Native Labour Association.

The Witwatersrand Chamber of Mines has time and again devoted great attention to the labour question, but has never succeeded in solving the problem. The Native Labour Association, formed under the auspices of the mining companies, has recently done good work, and has distinctly improved the supply of labour, but owing to the increased demand, the position generally is little better than it has ever been.

Great blame is due to the Government for the slipshod method in which the regulations referring to the labour supply are carried out. Years ago a satisfactory understanding might have been come to with the Portuguese, by which the whole of the Mozambique territory, with its swarming hordes of Kaffirs, might have been drawn upon. Under such an agreement, all the native chiefs would have been remunerated for the regular supply of drafts of labourers, who would be entitled to food and shelter at the expense of the mines from the time they left their kraals; all these would have been registered and handed over to the Chamber of Mines for a fixed period of service: the Transvaal and Portuguese Governments would have received a fee of so much per head—which would have amounted to a handsome sum yearly—and a regular system, to the benefit of the natives themselves, and to the distinct pecuniary advantage of both Governments, and the mining industry, would long ago have been established.

The Government and native labour.

As it is, this programme has been repeatedly attempted from Johannesburg, and has as often been passed over, or allowed to drift by the officials at Pretoria. There is no doubt that on this point the Government has shown itself indifferent to the wants of the industry. But great blame is also due to the mines themselves. Time and again a standard rate of wage has been fixed upon by all the mines, but no sooner has the supply of labour again become short, than one company after another has broken its pledge and engaged workmen surreptitiously, at higher wages, regardless of promises. This state of things has brought about the existence of a swarm of labour touts; these men penetrate into the districts where the emissaries of the Native Labour Association are at work; they promise the natives a higher rate of wage than that fixed as the standard, and induce thousands of men to accompany them to the Rand. Arrived there, they hand over the natives to any mine that is prepared to pay an unfairly high premium, or even at current standard rates, making the ordinary commission.

The "tout" system.

The natives find that they have been swindled: they do not receive the wage they were promised: they are naturally not in a position to distinguish between a tout and a duly authorised agent, and the consequence is, that at the first opportunity they leave the fields, and can never be induced to return.

Results of scarcity of labour.

Owing to the constant short supply of labour, which apparently will tend to become still worse, a great deal of harm is inflicted upon the industry. There are many mines that cannot keep all their stamps at work, and there are many others that do not for this reason erect the stamping power they would otherwise be justified in erecting. The expensive custom of using rock drills in the stopes, due entirely to the shortness of native labour, is now almost universal. This means the carrying of a far bigger stope than is necessary: the use of correspondingly more dynamite: the blasting down of a great deal of waste rock, which, despite the closest sorting, forms a large part of the product milled: and the general raising of expenses all round.

To my mind, without reducing the present standard of wages one penny, the resumption of a full native labour

A full supply, with sound administration of Pass and Liquor Laws, would mean a saving of 5s. a ton.

supply, systematised on the lines laid down, and which is a matter quite capable of realisation, and the honest carrying out of the Pass and Liquor Laws, would mean an average reduction on working costs of 5s. per ton, and means more to the industry than cheap dynamite and cheap railway rates put together.

Ore sorting.

Another problem, which is in process of being worked out, but not in a thoroughly satisfactory manner, is the problem of ore-sorting.

A reef is frequently only from 12 to 24 inches thick. To mine this it is found necessary, under the most favourable conditions, to blast down a total of 30 inches—that is to say, 24 inches of ore and 6 inches of waste rock. Usually the width blasted down, however, is more than this, averaging from 36 to 42 inches, and often when a rock drill has to be used in the stope, the total width of rock blasted down is 48 inches.

Its great importance.

Assuming that the value of the 12 inches of clean ore were 1 oz. to the ton, the value of the total product blasted down on a basis such as this, would only be 5 dwts.—an unpayable result. To make a narrow reef such as this pay, therefore, it is absolutely necessary that a large percentage of waste rock be sorted out on the surface before the ore is sent to the battery. A large quantity, comparatively speaking, of waste rock must always remain in the ore product, because, in blasting, much of it is broken into innumerable minute fragments, but it is nevertheless possible to sort out a great deal and to raise the value of the product considerably. In the last two years sorting has made great strides on the Rand. Large revolving tables and belts have been erected. Over these the rock, as it comes out of the mine, slowly revolves, streams of water play upon it, showing clearly to the sorters what is reef and what is waste; and, on a number of mines, from 20 to 30 and even 40 per cent. of the whole quantity is sorted out as being valueless. The mines employing this careful system of sorting are distinguished above their neighbours by their high yields per ton, and usually by their better comparative profits. But into the minds of consulting

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THE RAND—NATIVES WORKING IN A STOPE.

engineers, and especially managers, is stealing insidiously the knowledge that every ton of waste rock sorted out raises the working costs on the remainder by a slight fraction, and they begin to realise clearly that low working costs, the object of every manager on the Rand, and careful sorting, do not go together. Unfortunately, Witwatersrand managers—with very superficial reasoning, it has seemed to me—are judged by their costs per ton of ore crushed. The man who works for 20s. per ton takes credit to himself over his neighbour who works for 22s., and yet the latter, if he chose to relinquish his elaborate sorting, might also work for 20s., or perhaps 19s. It is true that shareholders benefit at the end of the year more by the latter's procedure than by that of the brilliant worker at 20s., but short-sighted directors on the spot, consulting engineers even, the Press, and a great many other people who ought to know better, are inclined to praise the manager with the low working costs, and to look with cold eyes upon the really sounder man who has the courage to prejudice his working costs per ton in favour of elaborate sorting.

Competition as to working costs militates against perfect ore-sorting.

But my contention is that sorting has not nearly reached a perfect stage yet. Every new mine that is being equipped should be provided with sorting tables or belts of double the area of those now in use; these tables should revolve more slowly than they do, and more jets of water should play on them. A white man, or several white men, of capacity, should be placed in charge of the sorting-sheds; the staff of native pickers should be doubled, and every bit of waste rock over the size of an inch should be removed.

Ideal ore-sorting.

Then we should have yields of 50s. and 60s. per ton from mines now producing 35s.; smaller stamp batteries, saving all the expenditure entailed by the present enormous equipments, would suffice; and the profits at the end of the year would be—relatively—distinctly higher. Certainly, working costs per ton would not show so well as at present, but the authorities, to whom the managers look for approval, would have been trained to a due appreciation of the relative values of a low working cost and a large percentage of sorting combined.

I sincerely hope that shareholders in individual Rand mines will take this question up, and that public opinion will change to the extent of setting as great an appreciation upon a large per-centage of waste rock sorted out, with correspondingly higher working costs, as upon low working costs with a slovenly milling of more waste rock than of ore, and a correspondingly low yield per ton.

Reciprocity between mining companies.

A fourth problem worth discussing, is that of reciprocity between the mining companies.

How money might be saved.

As it is, the capital expenditure on the Rand, upon surface equipments, for each individual mine, has reached an alarming and extravagant level. It is no rare thing, now-a-days, for the directors of a deep-level mine to spend £500,000 in hard cash before a single ton of ore is milled, while the expenditure on outcrop mines, too, has been little short of this. Of course, a very large expenditure is really necessary, but in many cases, by the exercise of due reciprocity, a saving of from £50,000 to £150,000 could easily be effected. To begin with, the different groups, and the different consulting engineers, and boards of directors, should work far more harmoniously than is the case at present. With a good understanding such as this, a saving of expenditure could be effected in many directions. Firstly, fewer shafts might be sunk. At present, by the mining law, every mine must have two means of egress in case of accident, but there is no reason why two adjoining mines might not agree to have three shafts between them—one shaft each for a main hauling-way, and the other a joint shaft, for ventilation, and for uses other than that of ore-hauling. Then, again, great facilities might be rendered between mines as regards the development of certain areas, which, from the occurrence of dykes, faults, or from their geographical position, may be difficult of access to the mine owning the same. But probably the most important saving, and this is a point I should especially like directors of new deep-level flotations to study, is what would be effected by the joint use—spread over two, three, or even four neighbouring mines—of battery, cyanide, and slimes plants, electric works, workshops, dams, and surface equipment generally. By means of reciprocal relationships of this sort immense sums would be saved on initial capital expenditures, and also a very substantial figure on actual working expenses.

Rand mines in detail.

And now we can pass on to a discussion of each individual Rand mine, and the chances it offers to the investor or to the speculator.

There are, as has been already stated, 156 mines on the Witwatersrand. Many more are now in process of formation, principally to work deep level areas, and, to a certain extent a list of these mines prepared now (March, 1899), will be before long out of date.

It is a matter of great difficulty to classify the mines in the most advantageous and succinct manner.

A general classification.

The course I have adopted is to classify them into three divisions, which are as follow :—

(*a.*) Mines on outside reefs—other than the Main Reef.
(*b.*) Mines on the Main Reef—outcrop.
(*c.*) Mines on the Main Reef—deep level.

These mines are further classified so as to show at a glance their financial position, and they are again further sub-divided into groups.

A short sketch of the main facts about each of these mines is added. At a later stage particulars are given of debenture issues, and also a table of estimated lives, and values of the leading mines, and a short account of the factors which determine such values.

Mines not situated on the main reef.

The following is a list of mines floated on reefs other than the Main Reef. The list was a much longer one years ago, especially after the 1895 "boom," which was responsible for quite a swarm of worthless flotations on the Black Reef, Kimberley Reef, etc. Of the thirty-two mines in this list only three—Rietfontein A, Lancaster, and Lancaster West—have any good ore in sight at present, and in the case of the Lancaster mine this ore is found rather on the Main Reef (known locally as Botha's Reef) than on the Battery Reef, on which the mine is supposed, nominally, to be working.

MINES SITUATED ON REEFS OTHER THAN THE MAIN REEF SERIES.

Statement as to the Financial Position.

Reef.	Name of Mine.	Issued Capital (£1 shares).	Debt and Debentures.	Remarks as to the Financial Position.
		£	£	
Black Reef ...	Midas East ...	175,000	—	£45,000 in hand.
	Midas Deep ...	150,000	—	50,000 „
	Middelvlei ...	175,000	—	12,000 „
	Middelvlei Deep...	90,000	—	10,000 „
	Middel Black Reef	110,444	—	
	South-West Randt	185,387	—	30,000 „
	Apollo	180,000	—	30,000 „
	Cornucopia ...	100,000		2,000 „
	Phœnix	200,000	—	5,000 „
	Rand Southern ...	80,615	8,000	7 % Debentures.
Battery Reef ...	Rip	111,950	—	
	Lancaster ...	300,000	180,000	Option on Reserve Shares to Redeem Debentures.
	Lancaster West ...	195,000	—	
	Violet	150,000	150,000	Options on 250,000 Reserve Shares.
	Randt (5s. shares)	80,000	—	
	Rand Junction ...	125,000	—	25,000 Shares have 15s. unpaid liability.
	Horsham... ...	190,000	45,000	Company has given a two years' option to reconstruct.
	Vulcan	90,000	—	£2,000 in hand.
	Lindum	500,000	—	70,000 „
Kimberley Reef	Great Britain ...	100,000	—	5,000 „
	Gordon Estate ...	92,000	—	20,000 „
	Bohemian ...	130,000	—	2,000 „
	Southern Jumpers	66,007	—	
	Elandsf'ntein No. 2	120,000	—	
	Randt Reefs ...	150,000	—	
	Rand Roodepoort (10s.)	60,000	—	
	Leeuwpoort ...	95,000	—	2,000 „
	Rand Central ...	200,000	—	60,000 „
Du Preez Reef	Rietfontein ...	270,000	—	
	Rietfontein A ...	317,500	—	
	Alexandra Estate...	250,000	—	25,000 „
	Waterfall (5s.) ...	25,000	—	

Outside mines are dangerous investments.

I must here emphasise an opinion that I have often expressed before, that is, that investors at a distance should not touch the shares of any of these outside mines. In individual cases they may be made successes, or temporary successes, and at times they form good enough speculations for those on the spot with an exact knowledge of all that is going on. But if investors in Europe buy these shares they will, in all probability, lose their money. As regards the Black Reef, eight miles to the south of the Main Reef series, I look on it with extreme suspicion, and would like to see every mine on this line put into liquidation.

The Du Preez reef is narrow and treacherous.

The Kimberley Reef and Battery Reef mines have this distinct point in their favour—the reefs on which the mines were floated originally are no good at all, but under both of them the Main Reef series lies at a workable depth. Already, in the case of the Battery Reef, which lies comparatively near the Main Reef series, the Lancaster and Lancaster West, by sinking to the latter series, have found payable ore. Other mines on the same line, when properly financed, may find themselves also in this position.

The Kimberley Reef mines are being bought up for Main Reef deep-level areas. Most of these mines are situated on the dip of poor stretches of Main Reef, but nevertheless a certain specious value, in these days of deep-level dreaming, attaches itself to the areas in question.

Midas East.

Midas East.—Has a lot of cash in hand, but little prospect of finding any payable ore. The property is a large one, but of no value.

Midas Deep.

Midas Deep.—Has 465 claims. A borehole was put down cutting the Black Reef, at 800 feet, and the directors reported that the reef was twelve inches wide, assaying four ounces. This happened some years ago, and it is curious that the company has not either put down more boreholes, or preferably a shaft, as there is cash in hand for this purpose. It is probable that this is only a local patch of rich ore, which will not continue.

The results of working in the Midas Estate, the outcrop mine, now liquidated, were not such as to warrant the idea that the Midas Deep would ever be a payable property.

Middelvlei.

Middelvlei.—There is no payable ore known to exist here.

Middelvlei Deep.

Middelvlei Deep.—There is no payable ore known to exist near this mine.

Middel Black Reef.

Middel Black Reef.—Should be liquidated.

South West Randt.

South West Randt.—Having found no signs of payable reef locally, thoughtfully invested most of its intact working capital, some £60,000, in a series of New Zealand mining shares. The directors, for reasons best known to themselves, selected absolutely the most worthless of all the bad New Zealand mines, for this essay in finance, and as a result, the money so laid out must by now have almost entirely vanished.

Apollo.

Apollo.—This is a typical Black Reef flotation. Fortunately there is some cash in hand which the shareholders ought to distribute.

Cornucopia.

Cornucopia.—A mine of no value.

Phœnix.

Phœnix.—This company may be reconstructed, but it would be more advisable to liquidate.

Rand Southern.

Rand Southern.—This company should be liquidated.

Rip.

Rip.—The Battery Reef ore, worked in 1896 by dry crushing, was found unpayable. The property of the company might be included in a flotation to embrace the deep level of the French Rand, and for that reason the shares have a speculative value. There are 343 claims.

Lancaster.

Lancaster.—This company has made an unexpected success of an area of ground hitherto thought worthless, but more from the Botha's Reef (Main Reef series) than from the Battery Reef itself. There is a large debenture debt, but against this are the regular profits of the mine, and a large reserve of good ore. The future promises to be successful, but the shares at high prices are not a tempting speculation.

Lancaster West.

Lancaster West.—This property is as yet an unknown quantity. It is expected to turn out as well as the Lancaster, and is under the same control. Until, however, the continuous results of a year's working give a definite value to the shares, the mine may be said to be over-capitalised. There are 151 claims.

Violet.

Violet.—A badly managed mine in the past. The ore in sight on the Battery Reef is unpayable, but it is thought that, as in the case of the Lancaster and Lancaster West, the Botha's Reef, underlying the Battery Reef, and not yet opened out, may prove more reliable. The company is now in the throes of reconstruction. There are sixty stamps erected, but no proper sorting plant. The shares are purely speculative. There is a very large claim area.

Randt.

Randt.—A poorly financed London flotation. Some ore of barely payable value was developed, but the company ran short of funds, and the mine had to be shut down in the middle of development. There are forty-six claims.

Randt Junction.

Randt Junction Reefs.—A doubtful venture, floated in London. No work has yet been done. There is a small balance of cash in hand.

Horsham.

Horsham.—The funds of this company were spent rather in the erection of a costly surface equipment, and eighty-stamp mill, than in the development of the mine. So far as is known, the ore developed is just unpayable, but further exploration on the reef, which is a fine regular body of ore, might be more satisfactory. There is a debt of £45,000, and the bondholders, while guaranteeing to cancel interest on this for two years, and to spend £10,000 in further prospecting work, have received an option for that period to reconstruct the company.

Vulcan.

Vulcan.—After a short period of working, a few years ago, the mine was shut down. It is thought that the reefs might eventually be payable, but only after the spending of a great deal of money—which the company is not in a position to do.

Lindum.

Lindum.—A large property of 550 claims. This mine will probably be reconstructed, and an effort made to prove the ground satisfactorily. There are stretches of payable reef known to exist, but these are not of great extent, and the country is somewhat badly faulted. There is reason to think, however, that if soundly developed, the mine might become a payable, though a low grade, venture. It is a possible deep level, too, of several of the Randfontein mines.

Great Britain.

Great Britain.—Some years ago it was thought that this company would make a success of the Kimberley Reef. A lot of ore was developed, on a very wide reef, and several good patches, although very irregular in their occurrence, were found. The payable section of several feet thick, however, among the mass of low grade ore, was found so difficult to locate, that the mine was shut down. Any future the company may have will be as a deep level of the Main Reef series, but as the Main Reef in this neighbourhood is poor, no great value can be set on the Great Britain claims.

Gordon.

Gordon Estate.—Was recently reconstructed, and is now being bored with a view to locating the Main Reef. The country in this neighbourhood is much disturbed geologically, and it is doubtful whether any good results can be expected.

Bohemian.

Bohemian.—This mine, in the same locality, is of no value.

Southern Jumpers.

Southern Jumpers.—This company, unless already liquidated, holds claims on the Kimberley Reef, which also form a very deep level of the Jumpers. The depth of the Main Reef here would be about 9,000 feet. Claims in the neighbourhood have a "boom" valuation of about £300 each.

Elandsfontein No. 2.

Elandsfontein No. 2.—Owns forty-two claims on the Kimberley Reef, valueless under that head, but worth £300 each as very deep levels of Jumpers outcrop mine. The whole value of the property would therefore work out at £12,000, or 2s. on each share.

Randt Reefs.

Randt Reefs.—Owns 115 claims on extreme dip of Jumpers, and adjacent outcrop mines. The claims are worth £300 each as deep levels, making a Randt Reefs share, therefore, worth about 4s. 6d.

Rand Roodepoort.

Rand Roodepoort.—Owns thirty-seven valueless claims on the farm Roodepoort, and eighty claims, equally valueless, at Klerksdorp.

Leeuwpoort.

Leeuwpoort.—Owns sixty-five claims on Kimberley Reef. It is thought that the Main Reef series will be found here, and boring is being done in the neighbourhood. But the formation is much broken in this locality, and it is probable that if the Main Reef is found underlying Leeuwpoort, or any of the adjacent blocks of claims, it will be both broken and of poor value.

Rand Central.

Rand Central Mines.—These areas adjoin Leeuwpoort, and the same remarks apply to these also. Boring is in progress, and the Kimberley Reef has already been located at a shallow depth. It is improbable that the Main Reef will be found here of any value.

Rietfontein.

Rietfontein.—Owns a large estate and claim area on Du Preez Reef. The most valuable area was floated off as Rietfontein A, for which the Rietfontein received 169,029 shares. These form its only valuable asset. The reef in Rietfontein has so far proved unpayable. There are forty stamps—now hung up.

Rietfontein A.

Rietfontein A.—This company has done very well for the last two years, although much troubled with a very broken reef. The locality is not a safe one for investors to go into, and the shares, whatever the prospect of the mine, should be left alone.

Alexandra.

Alexandra Estate.—This company's assets of value consist of its estate and its tree plantations. The reefs have been found to be valueless.

Waterfall.

Waterfall Estate.—Owns a freehold estate of 1,917 acres in the probable extension of the Du Preez line of reef. There is a small yearly revenue from claim licenses, but there is no reason to think that the reefs on the property are of any value.

The Main Reef series.

The *Main Reef* series extends for a distance of forty miles, between Klipfontein on the east, and Randfontein on the west. With the exception of two big blanks in the formation, one at Boksburg where a mass of dolerite has intruded, or overflowed, and the other at Roodepoort, where the whole formation has been thrown several miles north, the series may be said to be perfectly regular.

Beyond the extreme points mentioned, the continuation of the series has not yet been found. Without doubt it exists for many miles further in each direction, but the formation has either been badly broken, or the outcrops are hidden under a great depth of soil, or the reefs have narrowed down to mere stringers. Nor does it follow that the continuation of the Main Reef—even if found—would be payable. Of the last ten miles, east, on the already proved stretch, not more than two miles carry payable reef, and it seems to me that mining men entirely overrate the value of possible eventual discoveries on the extension of the series. I am inclined to think that no other important stretch of the Main Reef will ever be found to carry payable gold.

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THE RAND—A SECTION OF BANKET ON THE SOUTH REEF.

Many main reef mines are highly speculative,

I do not consider that any company formed to work an area on the known stretch of the Main Reef series can be called an unjustifiable mining venture—in other words, a swindle. But a great many of such companies are speculations pure and simple, and it seems absurd that shareholders and the public generally should put the inflated valuations they do upon many of these mines. There is all the difference in the world between a mine with payable ore, although it may be only ten claims in extent, and mines such as Rand Klipfontein, Modderfontein Extension, or Apex, which, although possessing ground by the thousand acres, have so far never found permanently payable stretches of reef.

as are also some deep levels.

Again, a number of the deep level mines floated on certain sections of the Main Reef are certainly highly speculative ventures. What benefit, except that of being part proprietors in a "Main Reef" property, have shareholders in such companies as the Chimes Mines, South Randfontein Deep, Rand Victoria, and others of a similar kind, as yet experienced? These mines were floated four years ago, but as yet not a foot of shaft sinking has been attempted. As a matter of fact, these mines, although good ore may be found at a great depth, have not got the necessary cash to attempt working, and the position would have been sounder had they never been floated at all.

I hope that in the following description of Main Reef outcrop mines readers will clearly note the distinction drawn between genuine mines and purely speculative ventures, and that they will refuse to countenance, in their financial actions, the wholesale gambling in these latter that is now rampant.

The following is a list of outcrop mines on the Main Reef, arranged according to groups, and showing the financial position of each mine at the present time.

MINES SITUATED ON THE MAIN REEF SERIES.

OUTCROP MINES.

Statement as to the Financial Position.

Name of Mine.	Issued Capital (£1 Shares).	Debt and Debentures.	Further Cash Required.	Remarks as to the Financial Position.
	£	£	£	
A Modderfontein (£4)	1,000,000	—	—	
Modderfontein Extension	325,000	—	p	
Witwatersrand	352,083	—	—	Option at £7 on 22,917 Reserve Shares.
Jumpers	100,000	—	—	
Heriot	111,864	—	—	
Henry Nourse	125,000	—	—	
City and Suburban (£4)	1,360,000	—	—	
Ferreira	90,000		—	
Robinson (£5)	2,750,000		—	
Crown Reef	120,000	—	—	
Paarl Central	400,000	—	—	
French Rand	560,000	200,000	70,000	Option on Reserve Shares to Redeem Debentures.
Wolhuter (£4)	860,000	—	—	
Treasury (£4)	540,000	54,000	—	Debentures.
Bantjes	434,350	—	200,000	
Consolidated Main Reef	711,500	120,000	—	Option on Reserve Shares to Redeem Debentures.
B Rand Klipfontein	63,640	—	p	£60,000 in hand.
Kleinfontein	231,250	100,000	—	Option on Reserve Shares to Redeem Debentures.
Chimes West	178,123	20,000	p	Option on Reserve Shares to pay off Debt.
Benoni	204,100	40,000	p	Option on Reserve Shares to pay off Debt.
Apex	125,000	—	p	
Boksburg	625,000	—	p	
Blue Sky	150,000	50,000	100,000	Will be Reconstructed.
Cinderella	100,000	30,000	100,000	Do. do.
Agnes Munro	93,000	90,000	50,000	Do. do.
Comet	225,000	175,000		Option on Reserve Shares to Redeem Debentures.
Angelo	275,000			Recent Debenture Issue paid off.
Driefontein	275,000			Recent Debenture Issue paid off.
C Ginsberg	160,000	—	—	
Balmoral	58,160	145,000		Proposed to Issue Reserve Shares to Liquidate Debt.
Glencairn	500,000	140,000		Option on Reserve Shares to Redeem Debentures.
New Primrose	300,000	—		
Spes Bona	150,000	90,000	—	Option on Reserve Shares to Liquidate Debt.
Langlaagte Royal	180,000	270,000	50,000	Will be Reconstructed.
New Unified	150,000	30,000	60,000	
Kimberley Roodepoort	175,000	40,000	60,000	
New Crœsus	300,000	80,000	—	Option on Reserve Shares to Liquidate Debt.

MINES SITUATED ON THE MAIN REEF SERIES—*Continued.*

Name of Mine.	Issued Capital (£1 Shares).	Debt and Debentures.	Further Cash Required.	Remarks as to the Financial Position.
	£	£	£	
D Langlaagte Estate ...	470,000	—	—	
Langlaagte Block B ...	632,500	—	—	Of the Capital, £82,500 is in 8 % Preference Shares.
Langlaagte Star	250,000	—	50,000	
Randfontein Porges ...	487,500	—	—	
Randfontein North ...	300,000	—	50,000	
Randfontein Robinson ...	574,500	—	50,000	
Randfontein Block A ...	547,500	—	150,000	
Randfontein Mynpacht...	632,500	—	150,000	
Randfontein South ...	400,000	—	-	
E Klipfontein	175,000	—	p	
Simmer and Jack (£5)...	4,700,000	293,000	—	Debentures will shortly be Redeemed.
Luipaard's Vlei	210,000	150,000	—	Option on Reserve Shares to Redeem Debentures.
F May Consolidated ...	275,000	—	—	
Geldenhuis Estate ...	200,000	—		
Princess	165,000	60,000	—	Option on Reserve Shares to Redeem Debentures.
Van Ryn	400,000	—	—	Recent Debenture Issue paid off.
New Goch	300,000	—	—	
Meyer and Charlton ...	100,000	—	—	
Aurora West	250,000	30,000		
Roodepoort U.M. Reef...	250,000	—	—	
Salisbury	100,000	—	—	
Jubilee	50,000	—	—	
Wemmer	80,000	—	—	
G Chimes	36,444	41,000	—	Option on Reserve Shares to Redeem Debentures.
East Rand Extension ...	250,000	—	p	100,000 Shares have only 7s. 6d. paid up.
Geldenhuis Main Reef...	150,000			
Stanhope	34,000	—	—	
Pioneer	21,000	-	—	
Langlaagte Propri'tary(£4)	100,000	—	50,000	
Vogelstruis Estate ...	200,000	100,000	—	Debentures Redeemable by Annual Drawings.
Durban Roodepoort ...	125,000			
Roodepoort West ...	40,000	—	—	
Grey's Mynpacht ...	200,000	—	—	
York	64,625	15,000	—	Option on Reserve Shares to Liquidate Debt.
West Rand Mines ...	240,000	160,000	—	Option on Reserve Shares to Redeem Debentures.
Windsor	100,000	—	—	
Worcester	95,722	—	—	
West Rand Central ...	80,000	—	—	
Champ d'Or	131,624	—	—	
Western Kleinfontein ...	110,000	—	p	£60,000 in hand.

In describing these mines we will commence at the east end, the first mine being :—

Klipfontein.

Klipfontein.—The company owns a freehold farm of over 2,000 acres. The Main Reef series has been located here in a number of boreholes, but much disturbed, and with almost invariable poor results. There is a small amount of cash in hand. The shares are entirely speculative and have no *intrinsic* value.

Rand Klipfontein.

Rand Klipfontein.—Owns a freehold farm of nearly 5,000 acres, and about £60,000 in cash. The reef has been located in a number of boreholes, but always with poor results. The shares belong to the entirely speculative class of Rand ventures.

Modderfontein Extension.

Modderfontein Extension.—Two years ago this mine was shut down, but before that a good deal of prospecting work had been done. The results showed that the reef ran through the property, but it is badly faulted, narrow, and only one small section, as the result of all the exploratory work, could be looked upon as likely to yield a profit. Owing to good developments in the eastern end of Modderfontein, Modderfontein Extension must be considered as having a certain speculative value, but there are no definite results to date to warrant the shares standing at a premium. The property is freehold over 4,000 acres, but only a comparatively small area is underlain by the reef.

Modderfontein.

Modderfontein.—This celebrated but hitherto unfortunate mine is opening out much better recently, and may now be referred to as a definitely payable mine. The only reason, however, that can justify the excessive market valuation of the property is the fact that there are over 1,200 reef claims, and, doubtless, speculators expect that the company will sell off several areas to subsidiaries.

Modderfontein forms an excellent example of the "valuation per claim" fallacy. People assume that each Modderfontein claim *must* be worth £3,000, and that, therefore, the shares are worth, at least, £12. But how many years will it be, and how much money will be spent, before the mine, and its subsidiaries, whose flotation must be assumed, will be earning the £300,000 a year which will be necessary to pay a reasonable dividend on the present market valuation? Looking at the mine in a coldly impartial light, we find that half-a-million has been spent on it, and that so far it has worked on balance at a loss. It has a wretched water supply, giving out for several months of the year, and the shares fell in two years from £18 to £1½. These are the actual results to date. They are not distinctly encouraging, and yet, such is the inherent desire of the public to gamble, and to discount any improvement, by at least five years, that the shares have again become a popular speculation.

Van Ryn.

Van Ryn.—The earlier directors of this mine, in the "boom" of 1895, showed themselves to be able originators and pioneers in the now fashionable recreation of flotation of "subsidiaries." They floated the Van Ryn North and the Van Ryn West, and on the strength of this the shares in the parent company were put up to £9. When the slump came, these able men again struck out a line for themselves, and showed an admiring financial world a new variation on the "subsidiary" theme: they reabsorbed these two flotations—and still to the extreme financial advantage of the parent concern. It came about in this way. It was found that the Van Ryn North, owing no doubt to some careless blunder, had been floated on the wrong side of the reef, and that there was no ore at all in the mine. The parent company was at that time very short of cash, in fact, heavily in debt, and as the Van Ryn North had fortunately £60,000 in the bank, it was decided to rectify the awkward mistake alluded to, by a reamalgamation, which was done. By this act, Van Ryn North shareholders received shares in a mine with ore in it, and the Van Ryn Company got the necessary cash. Then again, at a later period, it was found one day that the Van Ryn West was heavily in debt. As this debt had been guaranteed by the parent company, and was mostly due to it, it was necessary that such an unpleasant fact should be got rid of, so the directors of the Van Ryn, with exquisite delicacy of feeling, not only paid off the debt of the Van Ryn West,

Curious finance.

but absorbed the whole of that company, with its 80-stamp mill, and its well-developed mine, into the bargain. Now the Van Ryn exists as if these exciting matters had never taken place. It has 160 stamps; a poor labour supply; a large extent of ground; a narrow reef; and is well managed.

Reconciling these various factors, the directors have notified shareholders that when all the stamps are set to work profits of £15,000 a month may be expected. I trust I shall not be considered unduly pessimistic when I state that these figures are distinctly on the side of optimism.

Chimes.

Chimes.—The area of this company's mine is situated on a small broken patch of reef. This has now been entirely worked out, and for all practical purposes the mine is at an end. Enthusiastic shareholders still continue looking for another bit of reef, but this is costly work, and they will tire of it soon.

New Kleinfontein.

New Kleinfontein.—A low grade mine, but with over 120 unworked ore claims. The company is soundly managed, and there is a large reserve of ore opened out. The capacity of this mine is now fairly well known, and there seems to be little chance of any considerable improvements in profit-earning. There are 140 stamps, but owing to scarcity of labour never more than 100 have been worked. With all the stamps at work, profits of £100,000 a year might be earned, but this may be reckoned as the high-water mark of production, and is not likely to be attained for some years to come. The shares at over £2 are a doubtful investment.

Benoni.

Benoni.—There is one small patch, or chute of good ore in the mine, not enough to warrant the erection of a battery, and so far all other development, of which there has been a considerable amount, has failed to prove any more good ore. This mine exemplifies the fact, which I have already called attention to, namely, that except the small stretch of payable reef in Kleinfontein, Van Ryn, and Modderfontein, the whole stretch of the last ten miles of Main Reef, on the East Rand, is unpayable.

No doubt further development in Benoni is justifiable, and will be undertaken; but there is every reason for shareholders to consider their mine as a doubtful venture, and the shares, of course, are entirely speculative.

Chimes West.—This is another mine, which so far is shown to be unpayable, and although a good deal more exploration will be undertaken before the mine is absolutely condemned, it is as well for shareholders to realise that the venture is an entirely speculative one. The reef is a fine body, and regular in occurrence, but very low in value. Chimes West.

Western Kleinfontein.—There is every reason to believe that the reef in this mine is unpayable—in fact the company should never have been floated. Practically no work has yet been done on the property, although it was floated four years ago. The directors, in not wasting their money on the mine, have shown good judgment. The working capital thus saved has been invested judiciously, and the company now owns at least £60,000 in cash and good shares. It should be liquidated. Western Kleinfontein.

Apex.—The property of the company embraces the freehold of a large farm, which contains within its boundaries a coal mine, as well as numerous broken patches of the Main Reef series—which in this neighbourhood is badly disturbed. Within the last few months the explorations of the company have succeeded in locating what I think I may rightly classify as the first stretch of payable reef that has so far been found in the Apex. On this the shares have gone to a big price. But it is too soon to definitely assume that a payable mine will be evolved from the disturbed area owned by this company. The shares, owing to the size and geographical position of the property, have doubtless a great fascination for speculators, but investors, who buy on proved results, should not touch them until a much later period. Apex.

East Rand Extension.—The area of this company is 1,117 claims in different parts of the poor section of the East Rand, also claims at De Kaap, Heidelberg, and elsewhere; and a holding in East Rand Extension.

East Rand Proprietary shares. Boreholes put down on the principal block of ground, adjoining Apex, have, it is stated, cut a reef, or reefs, of good value. There is no evidence to prove, however, that the Main Reef series (if it *does* run through the ground) is likely to be payable over any great stretch. In the meantime the shares are only a gambling counter, though, I will admit, rather a tempting one to a certain class of speculators.

Boksburg.

Boksburg Mines.—This is another company holding a large area of ground on the broken and probably poor stretch of country that exists in this part of the East Rand. The property of the company is dangerously near to the great mass of diorite which cuts right through the formation here, and which apparently is responsible for the reefs being poor and broken up for miles on each side of the centre of disturbance. All these little matters are conveniently forgotten in a "boom," and the public, owing merely to the geographical position of the property (the surface map does not show a mass of diorite a mile wide), will probably, when the "boom" comes round, purchase the shares with eagerness.

Blue Sky.

Blue Sky.—This is the most easterly of the fine series of mines that belongs to the East Rand Proprietary Company. Readers must carefully note that from this mine *westwards* the Main Reef stretches in a regular line for many miles, and is almost invariably of good value, while from here *eastwards*, with the exception of the Modderfontein-Van Ryn patch, no payable reef has been found. It is absurd to talk about the wonderful developments in the East Rand district; they do not exist. The development of the subsidiaries of the East Rand Proprietary, from Driefontein to Blue Sky, has certainly been wonderful, but it has been known for years that these mines held a regular stretch of reef, and only wanted opening out to prove their value; excepting this, nothing new has happened. One patch of good ore has been found on Apex, and there is an improvement in the general value of Modderfontein. Beyond this, so far as I can see, from the Blue Sky for ten miles east, there is *no* new development, and whatever eventual results may be there is nothing to justify the optimistic feeling with which mining men now regard the district.

To return, however, to Blue Sky. The reef in that mine although good, is very narrow, and is not yet proved sufficiently to justify the immediate reflotation of the company. There are forty ore-bearing claims, and eventually the mine should be a profitable venture. The shares are a fairly good speculation up to par.

Cinderella.

Cinderella.—This mine, consisting of forty ore-bearing claims, will be absorbed by one, or two, new subsidiaries of the East Rand Proprietary Company, and the ground promises to be highly payable. The shares are quite a good speculation at £2.

Agnes Munro.

Agnes Munro.—Owing to the small area of this property, twelve ore-carrying claims, and to the fact that it is already in debt to the extent of £90,000, the shares cannot be considered as worth more than par; but the reef is distinctly good. The mine will be absorbed in a large subsidiary flotation.

New Comet.

New Comet.—Beginning in the New Comet, and extending westwards, as far as the Witwatersrand mine, there is a phenomenon which, to the fear of a few observant people, is likely to exercise a great influence over the future development of this section of the Rand. This is a large dyke which runs for this great distance, some four miles, parallel between the North and South Reefs.

I am afraid that this dyke has caused an ugly mishap to the formation; that it has actually cut the South Reef into two; and that the North Reef in this neighbourhood is nothing more than the top section of the South Reef, cut from its position, and thrown several hundred feet to the north.

I cannot prove this assertion, and I only give it as a theory, but it is undoubtedly a factor in the situation which all shareholders in this stretch of mines should take a note of.

A geological theory.

If it is so—this assumed theory—what will be its effect?

When the workings on the North Reef reach a depth of, say, 1,000 feet, the reef will be cut off by the dyke. All explorations south of the dyke will fail to find any continuation of the North Reef, and the mines working that reef chiefly, would in the future have to rely solely on the South Reef. This brings me to the statement of the very satisfactory point that the South Reef which is *not* likely to be cut off in depth, is distinctly the better reef of the two; that it is being worked to a much greater extent than the North Reef, and that, except for greatly reducing the theoretical tonnage of a claim in any of these mines, the fact of there being only one reef instead of two will have no visible effect for many years to come.

To lend additional weight to this theory we have in some of these mines, I believe, the indisputable fact of the North Reef dipping at a flatter angle than the South Reef, which seems, except for this hypothesis, an otherwise unaccountable thing. Opponents may argue that elsewhere on the Rand there are always two or even three reefs in the series, and that it is most unlikely that these additional reefs should have disappeared. My reply to this is that the East Rand is as yet only slightly explored geologically, and that the missing reef, or reefs, may exist in the shape of mere stringers, half-an-inch wide, which have never been noticed. Personally, I should be much pleased to find that my theory is a mistaken one, but in the meantime, as my object is to lay facts and eventualities before readers, I think it only right to mention what I consider *is* an eventuality, and to let shareholders and the public draw their own conclusions.

In the New Comet, the North Reef has been of a patchy nature on the whole, but recently assays have improved.

On the South Reef, not developed yet to any great extent, the ore appears to be still somewhat patchy. On the whole, there is no reason to think that the mine will not have a successful career, but it will be a distinctly low grade mine, and taking the profits earned in the past as a criterion, the shares appear at £3½ to be too high. There are about eighty unworked ore claims and 100 stamps.

Angelo.

Angelo.—So far, only the South Reef has been worked in this mine. The North Reef is poor, and, should it be cut off by the dyke, the loss to the Angelo would not be great. The South

Reef is exceptionally rich, and there is a large amount of ore developed. But there are only about fifty-five unworked South Reef claims, and on this reef alone, with 110 stamps, the mine will be worked out in ten years. The dividend should be 80 per cent. On these figures, based only on the South Reef, the shares, to yield 7 per cent. interest and redemption of capital invested, are worth, at a conservative estimate, £$5\frac{3}{8}$.

Driefontein.

Driefontein.—This is an excellent property, consisting of about 60 unworked South Reef claims. The North Reef in this mine, too, is poor. There are 110 stamps and a large reserve of ore developed. So far as can be estimated, the life of the mine, on the South Reef, should be twelve years; the dividend 45 per cent.; and the shares, on the South Reef alone, on a 7 per cent. basis, are worth £$3\frac{3}{8}$.

Balmoral.

Balmoral.—This property has only got North Reef in its area, and, after years of work, the result, on balance, has been a loss. I do not see much chance of improvement, and would advise intending purchasers to leave the shares alone.

Ginsberg.

Ginsberg.—This is rather a sound little mine, and is at present working the South Reef. The North Reef has been located in a borehole, but this is probably north of the dyke, and may not be found to continue in depth. Assuming that both reefs exist throughout the mine, but that the North Reef is as poor as in the Balmoral, the life of the Ginsberg, with fifty stamps, will be thirteen years more; the average dividend will be 35 per cent.; and the shares may be said to be worth about £$2\frac{3}{4}$.

Witwatersrand.

Witwatersrand.—It is almost impossible to set even an approximate valuation on the shares of this company. It owns a valuable freehold estate bringing in £12,000 a year revenue; five water-rights; 400 reef claims; and an excellent surface equipment; including 120 stamps. The ore lately developed in all parts of the mine is stated to be exceptionally good, and the shares are being eagerly bought by speculators.

On the other hand, the past record of the mine has been exceedingly poor. Even with its increased battery it earned during 1898 very indifferent profits, and up to the time of writing this (March, 1899) there is little sign, in the output, of the good ore which is said to be showing in every part of the mine. No doubt, in these days of the "valuation per claim" fallacy, and the "flotation of subsidiaries" movement, some wonderful shuffling of the cards may ere long take place.

As to earning legitimate mining profits sufficient to pay a dividend on the price of £7 to which the shares have risen, *i.e.*, £240,000 a year, I must frankly admit that I do not consider the mine can do it. As a gamble the shares may be all right; in the meantime, as an investment, I do not care to recommend them at more than half the price.

Glencairn.

Glencairn.—So far as is now known this mine also is low grade, but from the value of the ore being opened out in the adjoining mines, especially in the deep levels, it should improve rather than decline. Only 110 out of 160 stamps are at work; the excuse given is want of labour. Assuming all the stamps at work, the life of the mine would be sixteen years more; the dividend would average 30 per cent.; and the shares would be worth £2¾.

May Consolidated.

May Consolidated is opening out, as are all the other mines in this neighbourhood, distinctly better in the lower levels. Given a regular water supply, this mine should, in the future, and until it is exhausted, never again cause shareholders any anxiety.

There are about 26½ unworked claims; with 100 stamps the life will be ten-and-a-half years more; the average dividend 75 per cent.; and the shares are worth rather over £5¼.

New Primrose.

New Primrose.—This mine, as regards aggregate width of payable ore, has greatly improved in the lower levels. Under the same management as Glencairn, working costs are low, and the future should be even more successful than the past has been. With the present 160 stamps the life, from July, 1899, is fifteen years; the dividend should average 60 per cent.; and the shares are worth rather over £5.

Simmer and Jack.

Simmer and Jack.—The controllers of this, the largest mine in the Transvaal, are always so busy, either floating off subsidiaries; or splitting up subsidiaries already floated; or issuing debentures; or paying them off again; that for an outsider it is impossible to state at any given moment either the size of the Simmer; its debt; its cash in hand; the number of shares held in subsidiaries; or even the number of such subsidiaries themselves. When the directors settle down to steady work with the 280-stamp mill, which, by the way, they talk of increasing to 320 stamps, they will probably find that the property, fine as it is, is over-capitalised. Of the one-and-a-half million tons of ore developed, an immense quantity is of a lower grade than was ever expected, *i.e.*, it will not yield more than 8s. per ton profit, and should these poor patches continue in depth, or be found in other places, as certainly may be expected, it will be a difficult matter for the mine to keep up the present yield.

My estimate of the value of Simmer and Jack shares, after paying off its debenture issue, and allowing £1,600,000 as the remaining value of its outside assets, is £5 12s. 6d. On a basis of 320 stamps, this figure would be increased, but the mine, with a continued shortage of labour to face, is, in any case, an unwieldy undertaking.

Stanhope.

Stanhope.—This little property is practically worked out. It may scrape together profits, either on its last months of crushing, or from the sale of its machinery, to pay a shilling or two per share as a final dividend, but this cannot be expected with certainty.

Geldenhuis Main Reef.

Geldenhuis Main.—Has ever been an irregularly worked mine, and has ever failed to realise the profits which its controllers have continually predicted. Its life may be anything from four to eight years more, but I fancy that it will continue to disappoint shareholders as steadily in the future as it has done in the past. The shares are not worth 10s.

Geldenhuis Estate.

Geldenhuis Estate.—This mine has turned out a splendid success in every way. Its capacity is now known with something like exactitude, and is comprised in the following facts:—

Life from 1st July, 1899	6½ years.
Average annual dividend to be expected...	175 per cent.
Value of the estate	£100,000.
Value of the shares, taking 7 per cent. dividend, and redemption of capital invested	£8½.

Treasury.

Treasury.—On paper, Treasury shares work out well, and there is no reason to think that, in practice, the value will be found to be less. The mine is in an excellent locality, surrounded by others earning high profits, while the mine itself is now a well-developed, cheaply-worked venture. The company holds 5,737 Simmer West shares. The life should be thirteen years; the dividend 18 per cent.; and the value of the shares £6.

Jumpers.

Jumpers.—The life of this mine is about six years more, during which time dividends from ore mined should average 100 per cent. The company owns 11,394 South Nourse shares. The company holds also 29,188 Jumpers Deep shares, received in exchange for twenty-three claims, and if it secures bezitrecht on its further twenty-eight claims, now held as bewaarplaatsen, it will be entitled, in exchange for these, to a further 36,662 Jumpers Deep shares, making 65,850 in all. In this eventuality Jumpers shares would be worth £8.

New Heriot.

New Heriot.—Recently the value of the ore in this mine, especially in the Main Reef, has somewhat fallen off, so much so that an estimated future average dividend of 125 per cent. has now to be reduced to 100 per cent. On this basis Heriot shares are worth £8.

It must not be forgotten, however, in a mine like the Heriot, that there are already 400,000 tons of ore developed, and paid for out of current working expenses. For the last four or five years of the mine's life, it will have to do no development work, and no shaft sinking, and nothing need be charged for depreciation. Under these circumstances it is probable that the Heriot, during its last few years of life, may pay considerably more than the 100 per cent. reckoned on.

I would instance the shares at anything under £8 as a particularly sound investment.

Henry Nourse.

Henry Nourse.—This mine has ore reserves developed for several years ahead, and before long all the shafts will have reached the boundary of the property. The continued good value of ore in the present mine is assured. The company owns thirty-nine bewaarplaatsen, which, from their location, will probably be found to contain poor ore. Setting on these a net value, after deducting the probable cost of obtaining bezitrecht, of £1 15s. per Henry Nourse share, I estimate that the total value of the property is equal to £10½ per share. The shares at anything under this may be considered a sound investment.

New Goch.

New Goch.—It is stated with great assurance that the ore now being developed below the big dyke, of which there is already a large quantity in sight, will yield very satisfactory profits. Considering the past history of the mine, I cannot persuade myself that this newly-found patch of good ore is likely to be permanent, and I consider the shares extremely speculative. There are over forty unworked ore claims, and sixty heavy stamps, but it is quite impossible to hazard a guess as to what profits will be for, say, the first year from the recommencement of crushing.

Spes Bona.

Spes Bona.—For a long time past the Spes Bona has barely earned interest on its heavy debt—let alone profits. The mine is situated in a locality which has always produced poor ore. Even assuming a slightly better yield in the future, which recent assays seem to indicate, I do not suppose that the quantity of ore remaining in the mine is sufficient to pay off the debt of the company and dividends of £1 per share, much less can it be expected to yield redemption of capital invested.

Wolhuter.

Wolhuter.—The comparative failure of this company to earn large profits, which up to a year ago were confidently expected, is due to the fact that the most valuable reef has become, in the lower levels, a large mass, double its usual thickness, and carrying only the same aggregate of gold in its enlarged form, as it did when it was of ordinary stoping width. This is a serious matter: the reef looks well; it is of great width; regular in its occurrence; and yet it is only worth half its usual value. I do not specially instance the Wolhuter, because the same thing has occurred in other outcrop mines, and will occur in the deep levels also, but it serves to emphasise the fact that there *are* unknown risks, even in banket mining, and that except a mine has all its ore actually proved, either by its own development, or by the extensive workings of the immediate deep level, there are undue risks to be taken. In the face of this it is absurd to state, as many people do, that the shares of a mine like the Wolhuter, not proved on the dip, and exceedingly patchy, so far as is known, should be bought to yield 5 per cent. interest. I consider that 10 per cent. is the lowest interest possible on a mine such as this, and although my figures given in a table later on represent a valuation on a 7 per cent. basis, I cannot consider such a standard warranted.

A patchy mine.

The only knowledge of the value of the ground below the Wolhuter and adjoining mines, is gained from the Bezuidenville borehole, which cut through the reef at 3,251 feet. The ore was very poor, and was interspersed, very curiously, with layers of white quartz. Of course, one borehole, sunk to locate the reef, not to gauge its value, is no criterion for the valuation of a mining area, but it serves to emphasise the fact that an outcrop mine not proved by the workings of an immediate deep level, is more or less of an unknown quantity, and must not be bought to yield 5 or even 7 per cent.

In the Wolhuter, the eastern ground, under the Spes Bona, is opening out rather well. Small patches of better value occur also here and there in the principal workings, and help to keep up the present average. On the whole, however, the mine is still an unproved quantity, and the shares, although theoretically reducible to a fixed valuation, are decidedly speculative. On a 7 per cent. basis their value works out to £5 12s. 6d.

Meyer and Charlton.

Meyer and Charlton. A low grade mine, but with exceptionally low working costs, and a steady dividend payer. The company owned a small block of deep-level claims, divided from its present mine by eight claims belonging to the Wolhuter. These eight claims the directors recently bought for the Charlton for £105,000 a sound purchase, consolidating the area of that mine, and considerably prolonging its life. In addition the Charlton owns nine bewaarplaatsen, but these are some distance away, and if bezitrecht is granted to them, they will be incorporated in a deep-level company.

The Meyer and Charlton, with its present eighty stamps, has a life of ten years more; it should pay an average dividend of 85 per cent., and its shares, to those satisfied with 7 per cent. interest, are worth £6½.

City and Suburban.

City and Suburban. There are two outstanding points of interest in this mine at present, both, too, of an unpleasant nature, and accounting entirely for the disappointing results which shareholders have had to face.

The first is the fact that, at the eighth level, an extensive layer of rock, widening at the fourteenth level to 100 feet thick, has forced itself in between the Main Reef and Main Reef Leader. The consequence of this is that the Leader, always hitherto a reef of value, has been, in places, squeezed out of existence, whilst its aggregate value, between the points mentioned, has fallen to almost a minus quantity.

Notwithstanding this great loss of ore equal to a two years' supply, the reserves in the mine now stand at half-a-million tons, paid for from current profits. A slight improvement is noticeable in the value of the Main Reef Leader in the lowest workings, but it is probable that this intrusive rock will continue to do great damage.

Patches of poor ore.

The second fact, and an equally serious one, is that, just as in the case of the Wolhuter, the principal reef in the mine, the South Reef, has become in the lowest levels a mass of ore seven feet thick, and containing no more gold in the aggregate than it did when only three feet thick.

Like the Wolhuter, the City has no deep level on the dip at work, and shareholders are quite in the dark as to what the value of the ore is between the present bottom level of the mine and the boundary. There are, of course, especially on the west side, undoubted rich patches of ore, but the whole average of ore now being opened out is distinctly low grade. The policy of the company, seeing that the Main Reef Leader is now producing so little ore, is at present to mine a larger proportion of South Reef than in the past. In the upper levels, where this will be stoped during the current year, the South Reef still maintains a medium width, and is of good value, but I am afraid that in future years, unless a change again takes place, a falling off in profits must result. I have allowed for an average dividend of 15 per cent., which errs probably on the side of optimism, for a life of twenty years and have consequently, including the value of the company's township, placed a value on the shares of £6 7s. 6d.

Jubilee.

Jubilee.—A correct estimation of the value of this mine must take into consideration the value of its various outside holdings. These comprise :—

(*a.*) Village Main Reef shares	£10,000
(*b.*) $4\frac{1}{2}$ bewaarplaatsen	27,000
(*c.*) $15\frac{1}{2}$ bezitrecht claims—Wemmer Pan	93,000
Part of these are being sold for 25,173 shares in the South City less a liability of £12,586. The rest will be sold to the Suburban Deeps.	£130,000

equal to £$2\frac{5}{8}$ for each Jubilee Share.

When we add to this a life of seven years more for the mine, with a yearly dividend of 100 per cent., we get a total valuation of £$7\frac{7}{8}$ per each Jubilee share. These shares are undoubtedly a good purchase.

CITY AND SUBURBAN MILL—NIGHT.

Salisbury.—This company's assets comprise :— Salisbury.

(*a*.)	Mine dividends of 40 per cent. for 6½ years more. £2 a share.	
(*b*.)	15½ bezitrecht claims—Wemmer Pan (Part of these are being sold for 25,173 shares in the South City—less a liability of £12,586. The rest will be sold to the Suburban Deep).	£93,000
(*c*.)	2 bezitrecht claims	24,000
(*d*.)	4 bewaarplaatsen	20,000
(*e*.)	3½ bewaarplaatsen	21,000
		£158,000

The whole is equal to a valuation of £3⅝ for each Salisbury share.

Wemmer.—This mine has a further estimated life of 7½ years, crushing with seventy stamps; during that period it should easily pay an average dividend of 190 per cent. Wemmer.

In addition the company owns the following :—

- (*a*.) 36,226 Village Deep shares with a contingent liability of £60,092.
- (*b*.) A water-right, which, when bezitrecht is obtained, will leave a profit to the company of £50,000.
- (*c*.) 11 claims, bewaarplaatsen.
- (*d*.) 8 claims, bewaarplaatsen.

The total value of the mine and these other assets comes to the handsome valuation of £14¾ per share.

Ferreira.—The future of this mine has been calculated to a nicety. Ferreira.

For the next four years or so, milling with eighty stamps, a larger proportion of the rich South Reef, it will earn dividends of 300 per cent. After that the company will take over the forty stamps of the Worcester mine, which, by that time, will be worked out, and milling then a larger proportion of the poorer

Main Reef, but with 120 stamps, will still continue to earn dividends of 300 per cent. So far as is known, then, and in a mine proved as this is, there is no fear of a falling off in the value of the ore—the mine will pay 300 per cent. for eleven years more, and will then be worked out.

The following assets are also held:

6 bezitrecht claims, worth ...	£240,000
6 bewaarplaatsen	150,000
2 bezitrecht	14,000
11 bewaarplaatsen	33,000
	£437,000

or, equal to nearly £5 per share.

On the 7 per cent. dividend basis, Ferreiras are worth, on July 1st, 1899, £26½—all assets included.

Worcester.

Worcester.—This mine will be worked out in from three to four years more. It will pay 60 per cent. dividends till then, and as it owns several valuable bewaarplaatsen and other assets, the shares may be considered as worth over £3.

The company is contemplating a transference of its operations to a mine at De Kaap. On this venture it may lose money—or it may spend on its equipment a lot of the money which would otherwise be devoted to dividends.

Robinson.

Robinson.—This is the leading mine in South Africa, and has paid in dividends, to the end of 1898, £2,630,937. Apparently its future will be even greater than its past. By the end of this year (1899) there will be 200 stamps at work. There are still ninety-nine unworked claims, and a life of quite fourteen years more may be expected. The Robinson Company owns 60,119 shares in the Robinson Central Deep, received for 6½ claims.

The value of Robinson shares on a 7 per cent. basis is £10.

Pioneer.

Johannesburg Pioneer.—This mine should be finally worked out during 1899. Its valuation as at July 1st next should be approximately :—

(*a.*) Mine dividends, yet to come ... £2 per share.
(*b.*) Slimes in hand ... ... 1 ,, ,,
(*c.*) Value of Main Reef, which may be sold to an adjoining company (say) 1 ,, ,,

With these points to guide him, the investor should be able to set for himself a valuation on the shares.

Crown Reef.

Crown Reef.—This mine, from July, 1899, has an estimated life of five years, and during that period may be expected to pay average dividends of 240 per cent. An enormous dividend such as this, as I have already explained, is the result of the ending of all expenditure upon capital account, shaft sinking, redemption of plant, and development of ore—equal to, in the case of the Crown Reef, probably £100,000 a year. All these expenses will cease for several years before the mine is worked out, and of course will be reflected to the full amount in the dividends.

In addition, the Crown Reef mine owns fifty-one deep-level claims, held by bezitrecht, and 42½ bewaarplaatsen claims—worth altogether, on present valuation, £6¼ per share.

Taking all this into consideration, Crown Reef shares are worth £15¾.

Langlaagte Estate.

Langlaagte Estate.—The aggregate width of reef now worked in this mine, and at a very low cost, is sixteen feet. There are, approximately, fifty-four unworked claims, and on the present stamping capacity—200 heads—the mine will last for sixteen years more. An average dividend of 35 per cent. should be possible, and including the company's holding in such doubtful ventures as Langlaagte Exploration, Langlaagte Star, and Block B, the shares may be said to be worth £3 12s. 6d.

Langlaagte Royal.

Langlaagte Royal.—This mine is now shut down, and heavily in debt. The reefs in this property at a shallower point were highly payable, but in depth they became poor, and there is now a very large quantity of unpayable ore developed on all the lower levels. It is possible that an improvement might be found if the mine were developed still deeper, but it has been such a disappointment, and the company is so heavily in debt, that those in control are naturally afraid to take such a risk.

The shares are entirely speculative.

Paarl Central.

Paarl Central.—Month after month this mine yields returns which show no actual loss, but which are not sufficient to pay more than interest on the company's debt, which stands at £60,000. The locality in which the mine is situated contains persistently low grade ore, and there seems little probability that the mine will be really successful. There are about forty unworked claims.

Langlaagte Proprietary.

Langlaagte Proprietary.—A very low grade mine, held by French shareholders, and now shut down. It is possible that this mine might pay on a small scale if well handled.

Block B.

Langlaagte Block B.—This company's ground carries exceedingly low grade ore throughout. The mine has always earned sufficient profit to pay a dividend on its 82,500 8 per cent. preference shares, but until 1898 never paid on its ordinary shares. The ore is treated most economically. The mine has a long life, and the company owns 125,000 shares in the Langlaagte Exploration Company. In spite of these facts the shares are not a good speculation.

New Crœsus.

New Crœsus.—Very low grade. Recently reconstructed. An attempt, for the fifth or sixth time, is again being made to run this mine at a profit.

Langlaagte Star.

Langlaagte Star.—Another very low grade mine, which is now working without a profit. Readers will note that there is a large patch of the Main Reef series here which is barely payable under any circumstances. The mines situated on this patch are Langlaagte Royal, Paarl Central, Langlaagte United, Langlaagte Block B, New Crœsus, and Langlaagte Star, and would-be speculators should form a resolution not to invest in this group of mines under any circumstances. Beyond this area westward a slight improvement in the value of the reefs takes place. The next mine is the

Main Reef.

Main Reef Consolidated.—Such a mine as this, holding a freehold estate, and over 600 reef claims, becomes a favourite speculative counter during a strong market. To begin with, the mine itself, or rather such portions as have been exploited, has turned out quite successfully. It is, of course, low grade, but there is one stretch of reef proved payable for 3,000 feet in length, and this is continuing good in the deepest workings. It is, however, due to the fact that the company will issue two subsidiary companies, that speculators so eagerly buy Main Reef shares. The fascination of being able to print new scrip, whether the areas of ground represented by such scrip be good or bad, is too much for the speculating public, and it readily succumbs to what may be described as the "fascination of the subsidiary."

I have calculated that under the most favourable circumstances the Main Reef Consolidated and its two subsidiaries will commence to earn, four years hence, aggregate profits equal to a dividend of 9 per cent. on the present capitalised value of Main Reef shares—standing as they now do at 55s.

New Unified.

New Unified.—If this mine were properly equipped, it is quite probable that it would become a regular profit earner. To pay off the debt, and to erect a new mill and sorting-tables, would require £120,000, which sum I consider shareholders would be justified in supplying.

Aurora West.

Aurora West United.—There are 130,000 tons of South Reef ore developed, and 80,000 tons of Main Reef. The latter is unpayable, but the South Reef should yield profits of 10s. per ton. The main problem for this mine, which is soundly managed, is careful ore sorting, and there is good reason to think that profits of £30,000 a year can be earned with the present stamping power. As an investment, the shares at £2 are too high.

Bantjes.

Bantjes.—The company owns an estate, and a very large area of ore carrying ground. More money is required for development, but results to date warrant neither the erection of a battery, nor—a much more serious matter to speculators—the flotation of any subsidiaries. The future for this company is entirely problematical, and the shares are a doubtful speculation.

Vogelstruis.

Vogelstruis Estate.—Two years ago, when the battery of this mine was shut down, it was assumed that the working of the unoxidised ore would not leave a profit. Since that time, however, working costs have become less, and a slight improvement in the value of the ore at the bottom of the mine is noticeable. The shareholders have raised £100,000 on debentures, which money is being devoted to further development of the mine, and to the erection of further necessary plant. It is now thought that the company, on resuming crushing, may be able to make small profits.

Kimberley Roodepoort.

Kimberley Roodepoort.—This mine has a large claim area, but the ore is exceedingly low grade. So far, the mine has never earned regular profits. I am of opinion, however, as in the case of the Unified, that if the debt were paid off, the mine developed for a year ahead, and a new mill and sorting-tables erected, the mine would pay. To this extent I consider shareholders would be justified in raising £150,000, but the control of the mine should be in more energetic hands than has previously been the case.

United Roodepoort.

United Roodepoort.—A year ago this company was in a serious position. The shares were standing at £4 in the market, but the mine, owing to its short life, could not have returned more than £2 10s. in dividends. With great thoughtfulness, the shareholders of the Roodepoort Deep then came forward and allowed their mine, with forty-eight intact claims, and a further block of over 100 deep-level claims, to be amalgamated with the United. The Roodepoort United has now a life of eight years, with 110 stamps. An average dividend of 60 per cent. per annum should be earned, and, assuming that the deep-level block of claims is worth £375,000—a rather excessive valuation—United shares work out as worth £5.

Durban Roodepoort.

Durban Roodepoort.—This has been one of the best managed and most regular profit-earning mines on the Witwatersrand. But, as in the case of all these mines, there is strong evidence that the investing public has entirely forgotten to make allowance for the redemption of the capital invested. Durban Roodepoort has a further life of six years. During that time it will pay an average dividend of 125 per cent. In order to yield 7 per cent. interest and redemption of capital the shares should stand at £5¾.

Princess.

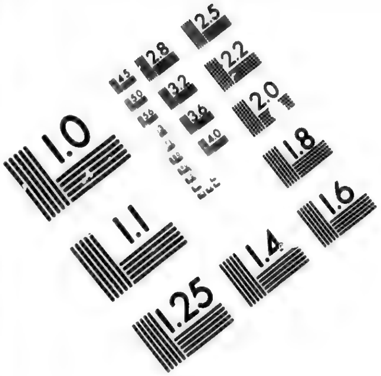
Princess Estate.—The reef in this mine is a mere stringer of banket, an inch thick, but it is payable, nevertheless, and were it not for the fact that the formation is broken by an endless series of faults, the mine would be a regular dividend payer. There is a large area carrying ore, and the company owns an estate which, from claim licenses and water-rights, yields a revenue of £8,000 a year. A scheme of active development to expose ore for several years ahead is necessary, and there is good reason to think that the mine may yet become fairly successful. In the meantime, the shares have not yet passed out of the speculative stage.

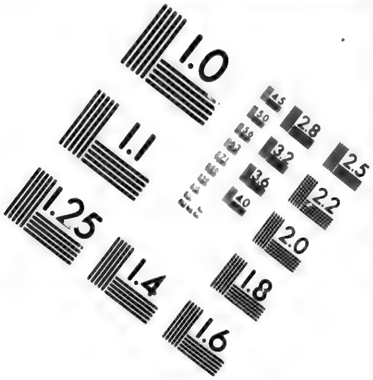
Roodepoort West.

Roodepoort West.—A reconstruction of the Banket mine. The reef is narrow, but of good value. The formation is badly broken all through the mine, and the area of South Reef is very small.

The shares are entirely speculative.

It is in the neighbourhood of this mine that the Roodepoort break occurs, which throws the continuation of the Main Reef series several miles to the north-west. The continuation is again picked up on Grey's Mynpacht.





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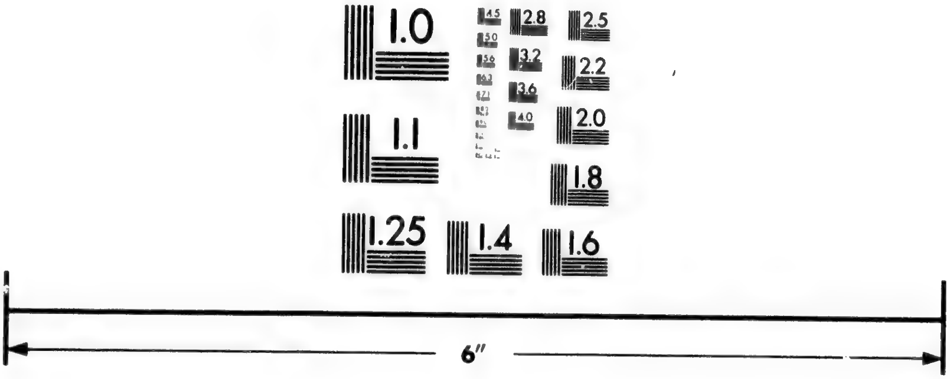

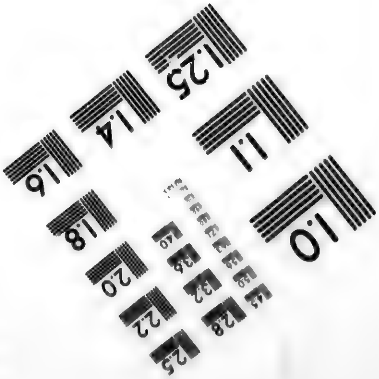

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Grey's Mynpacht.

Grey's Mynpacht.—A low grade, badly controlled mine, that promises to come to grief at an early date.

French Rand.

French Rand.—The French Rand is usually spoken of as a deep level. As a matter of fact the principal workings, and the richest ore, found *are* on the dip of the Champ d'Or, but the company also owns a lot of outcrop ground. In all there are 400 reef-bearing claims, but it is very doubtful whether more than one-half of these will be found to carry payable ore. There are now 250,000 tons developed, which will give an average yield of 38s. per ton, leaving 10s. profit. It is intended to increase the battery to 120 heads, for which purpose a total debt will be incurred, including the present debenture issue, of £270,000. Even with 120 stamps at work, assuming the present defective labour supply can be overcome, profits will hardly be such as to warrant investors buying the shares at £2.

Champ d'Or.

Champ d'Or.—From July, 1899, the life of this mine should be 4½ years, and the average dividend 50 per cent. This makes the shares worth £2¼.

Windsor.

Windsor.—This mine has turned out unexpectedly successful, but not enough is yet known of it in depth to warrant the shares being classed as a sound investment.

Luipaard's Vlei.

Luipaard's Vlei.—An estate, bringing in a revenue of £8,000 a year from claim licenses, and an immense number of reef claims, carrying particularly low grade ore, are the company's assets.

Time after time the company has been reconstructed, and time after time it has failed to pay. The directors have now definitely decided to adopt a dry crushing process for their ore—this despite the fact that all previous experiments of a similar nature on banket here have failed. I see no reason to assume that Luipaard's Vlei, with its low grade ore and dry crushing, will not again proceed to reconstruction in, say, 1902, 1904, 1906, and so on.

York.—Apparently the York mine has a life of from seven to eight years only, and, as its profit-earning capacity is exceedingly small, it is doubtful whether it will pay off the par value of the shares.

York.

West Rand Mines.—The small scale of operations undertaken by this company is out of proportion to the vast area of ground owned. Already, however, there is a debt of £60,000, and at least £100,000 in addition is necessary to put the mine on a solid basis. Eventually, patches of payable ore should be found, but the company is over-capitalised already, and by the time it has suffered reconstruction, present shareholders will find that their original shares have cost them a price which it will be difficult to recover. The present shares are a fair speculation.

West Rand.

West Rand Central.—A small, London controlled mine, which is not likely to pay much more than working expenses. There are twenty-nine claims.

West Rand Central.

Randfontein Subsidiaries.—This group of mines, the most westerly of any on the Main Reef series, I deal with under one head. It is the boast of those who control these mines that all information about them is withheld from the public. The public, to show its appreciation, eagerly buys Randfonteins and Randfontein subsidiaries on the first sign of a rising market, and speedily absorbs, without verification, any information which it may suit the controllers, at stated intervals, to put forth. Needless to say, the public has, again and again, lost heavily over these mines, but its gullibility is still unlimited.

Randfontein Subsidiaries.

The disregard of public opinion shown continually by the controllers of the Randfontein mines only serves to heighten the desire for possession of the shares. The accurate knowledge of this phase of human nature possessed by the controllers of Randfontein, and used by them to such advantage, is the envy of mining men in Johannesburg, and though I cannot endorse such a policy from the point of view of the public, I cannot but admire the astuteness of the gentlemen concerned.

To descend to facts:—

Porges.

Of the subsidiaries, **Porges Randfontein** pays an occasional dividend of 10 per cent.—averaging rather less than one a year. The company owns 200,000 South Randfontein shares.

South.

South Randfontein.—Recently commenced to crush, and has paid one 10 per cent. dividend. It appears to contain good ore.

North.

North Randfontein.—After working for several years at a loss is now shut down.

Robinson.

Robinson Randfontein is working without profit. The company holds 400,000 Block A shares.

Mynpacht Block A.

Mynpacht Randfontein, and Block A Randfontein.—Floated several years ago, have not yet reached a producing stage, and both were, at a recent date, shut down.

All these mines own large claim areas, but are poorly equipped, do not practise ore-sorting, and as can be easily seen, have not proved in the aggregate successful.

A new reef on Randfontein.

Recently, six more subsidiaries were floated. This, I believe, was done to evade a certain alteration in the gold law which is about to come into force. I cannot ascertain that these mines have any working capital to speak of, so consider that they are not worth discussing. A further large batch of flotations is promised. Recently a new reef was found on Randfontein which, it is assumed, traverses all the mines. It is reported that this reef is of considerably good value, and that the prospects of all the mines are much improved thereby, but I believe I am right in stating that this reef, although good in places, is not consistently payable, and that not nearly enough work has been done on it to warrant any exaggerated assertions as to its value.

On the whole, probably, the new reef will be found to be an asset of value to a certain extent, but the general condition of the Randfontein mines is such that a genuine improvement must take place before they shall have become reasonable speculative ventures.

Deep levels.

When the Witwatersrand banket beds were discovered, in 1885, expert opinion varied exceedingly as to a diagnosis of their nature. Indeed, for some years after that, all knowledge as to their composition was purely empirical. After 1890, however, it gradually became apparent that these reefs had been laid down by the action of water, that the gold contents would, therefore, be distributed, and that they were likely to extend to a great depth. As all these facts were exactly borne out by practice, and as the reef dipped towards the south, it was at once evident that all ground lying to the south, which, except for the first thousand feet or so, had been reckoned as worthless, was in all probability underlaid by the reef, and, therefore, of great prospective value. Most of the mines then in existence had only secured about 1,000 feet of ground on the dip of the reef, and all ground beyond that, henceforth known as deep-level areas, was at once snapped up by capitalists, proprietary syndicates, and such of the outcrop mines as had time to grasp the future possibilities of such areas.

Their inception.

We now return to a discussion of the theories which had led to this rush for deep-level ground.

Geological.

A banket reef or bed is a conglomerate of white quartz pebbles cemented together by a mixture of silica and sand, thickly sprinkled with pyrites, and in which mixture the specks of gold, although seldom visible to the naked eye, are found. This conglomerate was originally laid down on the bottom, or perhaps only on the sloping beach, of a great inland sea. The white pebbles were probably the remains of earlier quartz reefs which had been broken into fragments and finally became waterworn. During this process, most of the gold contained in the quartz fragments became liberated, and, in countless specks, by the ceaseless washing of the tides, became distributed throughout the whole bed. In course of time the detritus being washed into this particular sea ceased to contain quartz fragments, so that another layer, containing no quartz and no gold, became deposited on the top of the pebble bed. In the course of ages by the deposition of layer upon layer of sand, the pebble bed is found to be lying several thousand feet below the bottom of the sea, cemented into a compact mass by pressure from above, but still containing the countless specks of gold distributed throughout, and ready for the eventual and profitable use of still uncreated man. In the course of time, by ordinary geological processes, the sea, having fulfilled its particular destiny, flowed elsewhere. As to the final geological process, science is at present in the dark. How has the edge of the pebble bed been again brought to the surface? Was the bed originally the bottom of the sea, and has it been tilted up by a great convulsion of the earth, or was it originally the beach of the sea, and at present lying not much out of its original position? The question is deeply interesting; but the fact remains that, in 1885, the edge was found sticking out at the surface, and since then mining operations and boreholes have proved that the bed extends without any real break to a vertical depth of nearly 4,000 feet, and that its slope, excepting near the surface, is wonderfully regular.

Experts' opinions and deep levels.

But all these facts, especially the proving of the reef to great depths, have only been gradually elicited. Shortly after 1890 the best expert opinion foretold, with wonderful accuracy, the finding of the reef in depth, and the extreme probability, owing to its being deposited by water, of the gold contents being just as large at any given depth, approximately, as at the surface.

It must be borne in mind that, since the discovery of the Rand, and particularly as regards the question of deep levels, gold mining knowledge has had to be largely readjusted. The previous history of deep gold mining consisted almost entirely of quartz veins, which originally in molten masses had filled the cracks and fissures in the solid rocks.

In reefs of such nature it is usual to have small rich patches, in which the concentrated gold, or gold originally held in solution, has settled, and for the remainder of the mass to be worthless. With reefs of such a treacherous nature, to sink a shaft of 1,000 or 2,000 feet on chance, would have been a dangerous experiment, so that deep-level mining, up to the days of the Rand, was almost an unpractised science.

Most of the leading gold mining experts of the world have visited the Rand. Their opinions, some of them formed at a time when there were few data to go upon, are unanimously in favour of the accepted theories, that is to say, of the continuation to great depths of the reef; of the reliability of its gold contents at any given depth; and of the sound nature of mining operations connected with its exploitation. And with all this body of expert opinion, entirely favourable to deep-level enterprise, and various facts, such as the finding of the reef in boreholes, becoming known, we may consider the theories originally held about the deep levels of the Rand to be satisfactorily confirmed. The theory as to the permanence and value of the reef in depth justified the sinking of large sums of money, and was, at an early date, confirmed by actual facts.

The permanence of deep levels established.

We have now to inquire if the original theories have been fully borne out by results during the last five years, and therefore to judge whether deep-level mining is a scientific, sound, and profitable operation.

Although, speaking generally, the gold contents of the whole banket bed were supposed to be evenly distributed throughout, it was surmised, and correctly so, that the deep-level areas directly below the richest outcrop mines would be richer than those beneath the poorer outcrop mines. It also applied that, where the outcrop mine was little disturbed by faults and dykes, the deep level of the same mine would also probably be comparatively free from such disturbances. With these points in view, the earliest deep-level mines floated were those directly underneath the richest and least disturbed outcrop mines.

Rand Mines, Ltd.

In 1892, a large deep-level proprietary company was floated, the Rand Mines, Limited. It held 1,800 claims, selected with great forethought directly beneath all the richest and least broken outcrop mines. Several boreholes were sunk, notably on the dip of the Geldenhuis and Crown Reef mines, cutting the reef exactly where predicted, and half-a-dozen subsidiary deep-level mines, each with from 150 to 200 claims, and each with several hundred thousand pounds working capital,

Boreholes.

were floated. By this time all the deep-level area on the Rand which was thought to contain the reef even at the extreme depth at which mining could be carried on, was pegged out, and claims in favourable and unfavourable localities were bought and sold for thousands of pounds each. Boreholes were sunk outside of the central and richest portion of the Main Reef, cutting the lode in almost every case, and further companies were floated and financed in the same lavish manner. In 1893, by far the deepest borehole yet sunk, struck the reef a long distance below the then boundary of the Simmer and Jack mine, at a depth of 2,385 feet. As the engineers of most of the already floated deep-level mines estimated that the reef would run out of their ground at a depth of not more than 2,000 feet, it at once became evident that a second row of deep-level mines could be formed to work the still deeper areas, which, owing to the flattening somewhat of the banket bed, still lay within a practical mining depth. To this end the Gold Fields Deep Proprietary Company was formed, and its financing was guaranteed by the Consolidated Gold Fields of South Africa, Limited. As if to justify this further great undertaking, which involved the sinking of millions of capital, the reef was again struck, in 1895, on the dip of the Meyer and Charlton mine, in the centre of the Rand, at a depth of 3,251 feet. This, until recently, was the deepest borehole ever sunk in the Transvaal, and it has proved, almost to a certainty, that enough of the pebble bed lies under the Witwatersrand to last for forty yea. to come.

Second rows.

Goldfields of S.A.

Problems in deep level mining.

It was soon discovered, as the deep-level operations proceeded, that the natural conditions for deep-level mining on the Rand were distinctly favourable. There are four drawbacks to deep-level mining. These are:–

(1) Loss of value in the ore. (2) Broken ground.
(3) Water. (4) Heat.

Value of ore in depth.

Owing (1) to the water-laid origin of the reef, it was almost certain that the gold contents would not become poorer in depth. In the aggregate this theory has proved correct. Particular areas of deep-level ground have proved unexpectedly poor; other areas, however, have proved to be good; but the average deep-level ground has proved to be about equal to the average outcrop ground.

Broken ground.

With regard (2) to broken ground, such exists in all mines, and few mines on the Rand are free from faults; but, on the whole, the faults in the deep levels, although more frequent than in the outcrop mines, have been found to be easily traced, and are not reckoned as a serious factor. The rock formation (3) is so regular that a comparatively small amount of water finds its way into the deepest workings when they have once been pumped dry of the water tapped during shaft sinking.

Water.

Temperature.

Finally (4), the increase in temperature is found by experiment to be not more than 1 degree in 200 feet, and there is no reason why the temperature, with a formation of solid sandstone, should debar mining operations at, at least 6,000 feet.

Experience gained from outcrop.

The experience gained by the working of the outcrop mines is another point which the engineers of the deep-level mines have in their favour. In the outcrop mines millions of pounds have been spent needlessly upon inferior machinery and installations, upon useless shafts, and upon the tracing of lost portions of reef. In the deep-level equipments the most perfect and efficient machinery is used from the commencement, no useless shafts are sunk, and the tracing of faulted patches of reef, with the plans of the outcrop mines as a guide, is a work of comparative simplicity.

Working expenses.

It may indeed be accepted with perfect confidence, that, except in the very deep levels, the working expenses will be no more than those of the outcrop mines. In the deeps there will be a rather higher cost for dynamite, owing to the harder nature of the ground; for labour, owing to the flatter reef necessitating more shovelling of the ore; and, for coal, owing to the greater depth from which the ore has to be hoisted; but these are mere fractional increases, and are easily balanced by the economy effected by a finer equipment and a more compactly planned surface plant.

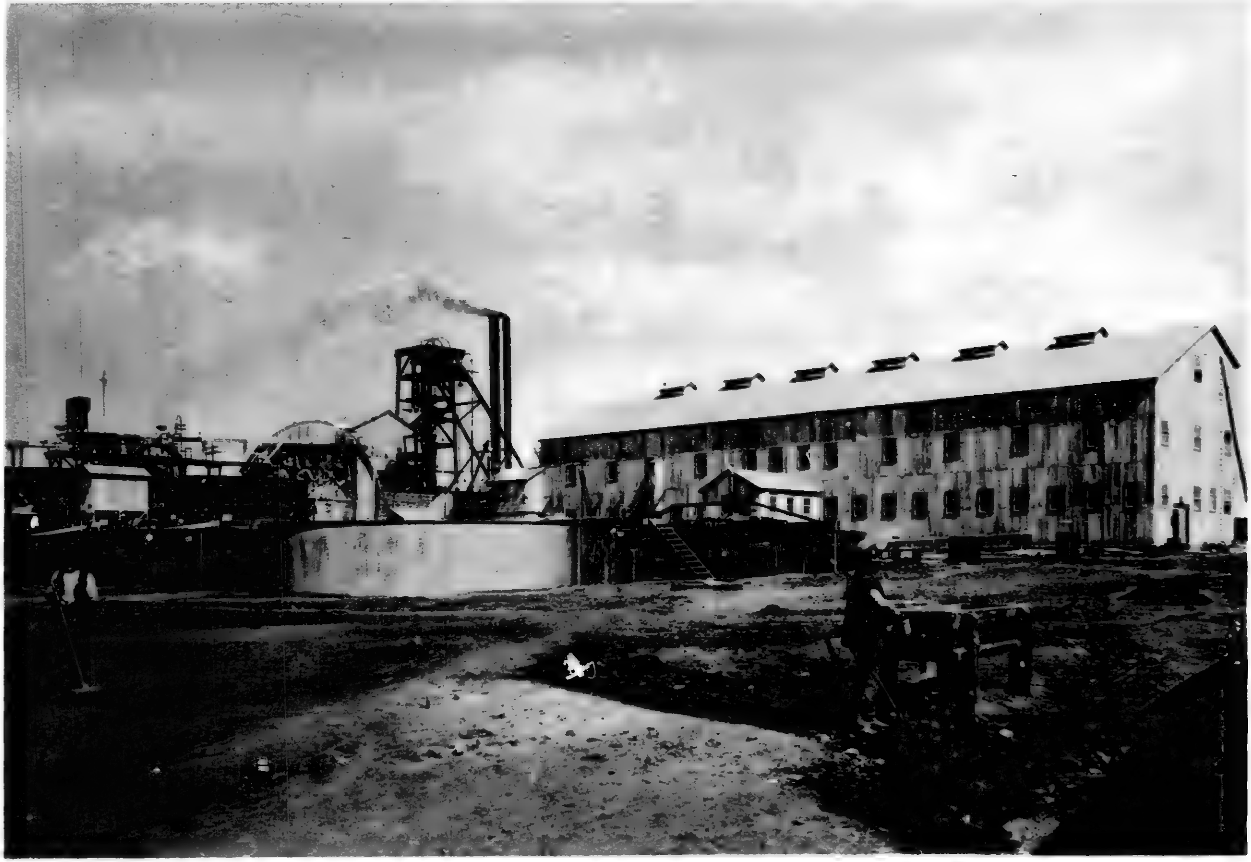
Unfavourable features.

It is now necessary, after so much praise, to point out several matters which, to the genuine investor, represent the weak side of the question. As we have seen, the early floated deep levels were specially selected with regard to their proximity to rich and little disturbed outcrop mines. As the demand for shares increased, however, company promoters turned their attention to the deep-level ground of the poorer and more broken mines, with the result that some deep-level mines were floated which should have remained uncapitalised until mining conditions in the Transvaal had improved. There is no doubt that these mines will contain the reef, but it is doubtful at present whether it will pay to work them. These mines will be specified in due course.

Some mines are situated in poor localities,

others are badly cut up by dykes and faults.

Secondly, there is the question of individual mines being badly cut up by faults and dykes. These mines, also, will be specified. As has been stated, the general question of disturbed ground in the deep levels is not a very serious one. On the whole, the disturbances are not more serious than in the outcrop mines, and are more easily traced. It so happens, however, that at from 800 to 1,200 feet deep the banket bed, which near the surface lies at a steep angle, here flattens considerably. The result is that at the change of angle there are, in some localities, patches of badly disturbed reef, and these patches have been encountered by the development work of several of the deep-level mines. As a matter of fact, these disturbances, about two years ago, gave rise to some anxiety, but subsequent workings prove that as the reef assumes, in depth, its normal angle, the disturbances die out, and the position generally is now much better than it was at that date. The result is, however, that certain mines have had to spend more money in development work, and have been somewhat retarded in reaching a producing stage. Then, again, there is the question of faults or dykes, at present unknown, that may be encountered deeper. This, of course, is a risk connected with all mining, but a special example may here be cited.



A RAND DEEP LEVEL—SURFACE EQUIPMENT.

Simmer East fault.

Two years ago the Simmer East Company, a second row deep level, sunk a borehole and expected to cut the reef at 2,800 feet. Instead of this, it was found at 1,830 feet, having been thrown up, by a fault, a distance of nearly 1,000 feet. This may turn out eventually to be a fortunate circumstance for the Simmer East Company, and, indeed, should the fault extend laterally, for a number of the second row deep-levels; but at the same time, it shows that serious faults are to be expected even at a great depth, and that the deeper mines will have to carefully locate the reef by boreholes before commencing work. These remarks do not apply so much to the first row deep-levels, in which it is very unlikely that there are any faults of such a nature.

Scarcity of Kaffir labour.

Thirdly, there is the question of Kaffir labour. Owing to lack of organisation of the great sources of labour on the East Coast, the Kaffir labour supply on the Rand has rarely been equal to the demand. Unless something is done almost immediately to remedy this, the question will become a serious one. A number of the biggest deep-level mines have started to crush with from 100 to 200 stamps, but there seems little likelihood of these mines being able at present to secure labour for more than three-fourths of their capacity. The question will remain a serious one until the Transvaal and Portuguese Governments and the Rand Chamber of Mines come to terms, and then it will be settled with little difficulty.

The financial question.

But the financial question is really the most important affecting the deep levels. In this respect the position is incomparably sounder than it was at the end of 1897, and is undoubtedly one of the principal factors that has caused the recent great rise in the values of deep-level shares.

Cost of equipping a first row deep.

To fully equip a *first* row deep level for 200 stamps, and to develop from 500,000 to 1,000,000 tons of ore, costs about £540,000; while the nine first row deeps controlled by the Rand Mines, Limited, spent on an average £500,000 before they commenced to return any profit at all.

A second row.

To equip a *second* row deep level for 200 stamps, and to develop from 500,000 to 1,000,000 tons of ore ahead, will cost about £650,000. While in addition the working capital paid in will be lying for a longer period without earning interest.

A third row.

To equip a *third* row deep level, in a similar manner, with shafts varying in depth from 4,000 to 5,500 feet, will cost, probably, a minimum of £750,000. No mines in this category, although several have been floated, have yet arrived at such a stage of development that any accurate data as to costs, or as to engineering problems, are possible.

All well located deeps will be satisfactorily financed.

As regards the question of deep-level finance, I think we may take it that every well located reasonable mining proposition on the Rand—such is the strength of the financial groups behind these concerns—will, in the future, be provided with the necessary cash for its development, from time to time as required.

There are at present (March, 1899), forty-seven deep-level mines on the Rand.

Of these fifteen have already received all the money which they will require.

Summary of financial position.

Of the remaining thirty-two mines, which will require additional cash to the extent of £11,590,000 exclusive of other sums being provided for new flotations—twenty-two will, in all probability, be satisfactorily financed during this and next year.

The remaining ten mines will probably be furnished, from time to time, with enough cash to cut the reef and do some development work, but most of these mines are in bad localities, and may never arrive at producing stage.

The following account of the individual deep levels contains practically all the facts about these mines that appeal most strongly to investors.

The summary is prefaced by a table of these companies, giving the following particulars:—

(*a.*) Control. (*b.*) Issued capital.
(*c.*) Debt. (*d.*) Further cash required.
(*e.*) Remarks as to the financial position.

MINES SITUATED ON THE MAIN REEF SERIES.—DEEP LEVEL MINES.

Statement as to the Financial Position.

	Name of Mine.	Issued Capital (£1 Shares)	Debt and Debentures	Further Cash Required.	Remarks as to the Financial Position.
		£	£	£	
A	Geldenhuis Deep ...	300,000	128,000	—	**Debentures Redeemable by Annual Drawings.**
	Crown Deep	300,000	—		
	Rose Deep	425,000		—	
	Glen Deep	600,000		—	
	Jumpers Deep... ...	523,895	—	—	
	Langlaagte Deep ...	650,000	500,000	—	**Will Issue Reserve Shares to Liquidate Debt.**
	Nourse Deep	450,000	—		
	Durban Ro'depo'rt Deep	300,000	200,000		**Option on Reserve Shares to Redeem Debentures.**
	Ferreira Deep	900,000	—	—	
	South Rand	300,000		650,000	
	South Nourse	540,000	—	100,000	
	Robinson Central ...	400,000	—	150,000	
	Village Main Reef ...	400,000	—	—	
	Village Deep	377,542	—	500,000	**Will Issue Reserve Shares at £5 to meet eventual Debt.**
	Bonanza	200,000	—	—	
	Angelo Deep	435,000		450,000	
	West Roodepoort Deep	227 200	—	200,000	
	City Deep	450,000	—	300,000	
	South City	460,346	—	320,000	
	Suburban Deep ...	375,000		500,000	
	Wolhuter Deep ...	392,500		270,000	
	South Wolhuter ...	450,000		400,000	
	Klip Deep	375,000	—	450,000	
	Witwatersrand Deep ...	351,900	200,000	200,000	**Option on Reserve Shares to Redeem Debentures.**
	Knight Central ...	412,739	—	450,000	
	Driefontein Deep ...	381,000	—	400,000	
	Vogelstruis Deep ...	330,000	120,000	250,000	**Option on Reserve Shares to Redeem Debentures.**
B	Robinson Deep ...	450,000		—	
	Simmer and Jack East	600,000	500,000	—	**Option on Reserve Shares to Redeem Debentures.**
	Simmer and Jack West	300.000	—	500,000	
	South Rose Deep ...	429,300	—	400,000	
	South Geldenhuis Deep	322,000	—	400,000	
	Rand Victoria	630,000		—	
	Rand Victoria East ...	375,000	—	450,000	
	Knight's Deep... ...	443,093	400,000	—	**Option on Reserve Shares to Redeem Debentures.**
	Jupiter	467,200	400,000	—	**Do. do. do. do. do.**
C	Cinderella Deep ...	500,000		250,000	
	Steyn Estate	300,000	—	400,000	
	Roodepoort Central ...	220,000	150,000	100,000	**Option on Reserve Shares to Redeem Debentures.**
	South Village Deep ...	593,334	—	700,000	
	Bantjes Deep	400,000		650,000	
	South Randfont'in Deep	225,000		500,000	
	South-East Rand Deep	200,000		—	
	Kleinfontein Central ...	225,000		500,000	
	Chimes Mines... ...	325,000		600,000	
	Langla'gte Block B Deep	75,000	12,000	300,000	
	East Roodepoort Deep	170,000		250,000	

Geldenhuis Deep.

Geldenhuis Deep.—Area, 188 unworked claims on the dip of the Geldenhuis Estate. Commenced crushing in 1895 with 100 stamps. At that date the mine was not properly opened up, and the labour supply was inadequate. This necessitated, in order to keep the stamps at work, the milling of hurriedly mined, unsorted ore. For a year, the returns were very poor and were unfairly quoted—this being the first deep mine to start work—as a criterion of the value of deep levels generally. When the mine was got into proper order, when the management took due cognizance of a rich leader which was being left behind on the wall of the stopes, and when the ore was carefully sorted on the surface, a great improvement took place. The stamping capacity was gradually increased until the whole 200 stamps were at work, and for two years now the profits earned have been exceptionally high.

In 1898, the company paid 75 per cent. dividend, and possibly 100 per cent. may be paid for 1899. As there are a million tons of ore in sight, of the present average value, it is safe to assume that a dividend of about 100 per cent. may be expected with regularity. Owing to the unusually large reef, an additional sixty stamps may be erected shortly, which would add considerable value to the shares.

The life of the mine, with 200 stamps, would be about twenty years, and on a 7 per cent. basis, the shares are worth £10.

Crown Deep.

Crown Deep.—Area, 157 unworked claims, the deep level of Crown Reef and Bonanza. The capacity is now 200 stamps, at which figure it is likely to remain. There are about 800,000 tons of ore developed. So far as is known this will yield about 40s. per ton. The estimated average of the mine, at an earlier stage, was from 45s. to 48s. per ton, and to this extent, that is to say, of earning from 5s. to 8s. per ton less than was expected, the mine has proved disappointing. But even as it is, a profit of almost £1 per ton can be relied on—from ore in sight—for years to come, and the mine on this basis takes its place as one of the best on the Witwatersrand. A better average value may be secured when the eastern workings of the mine open up the rich ore coming from the Bonanza and Robinson—this, indeed, is probable. The mine is badly cut up by dykes, which do not interfere with the actual existence of the reef, but add to the cost of development. The life may be placed at eighteen-and-a-half years.

The company holds 113,384 Robinson Central Deep shares; including these shares, the value of Crown Deep is about £13 5s.

Rose Deep.—Area, 171 unworked claims on the dip of the New Primrose. The ore developed is in the neighbourhood of one million tons; this is being crushed by 200 stamps, and owing to the unusual width of the reefs, it is contemplated erecting sixty more. The mine is cut into two portions by a big dyke, several hundred feet wide, but as the ore below the dyke is of excellent grade, and as the dyke itself has caused a valuable overlap of reef, the mine has not suffered severely from its presence. Rose Deep.

The results from this mine to date have been wonderfully good, and to all appearance they will continue equally so. The area of the company seems to cover a large patch of particularly thick ore, and the history of the mine will be a noteworthy one.

A regular dividend of 80 per cent. should be quite possible, with the certainty of increasing this to 100 per cent. when the other stamps are put up. The life of the mine, with 200 stamps, is twenty-four years more, and on a 7 per cent. basis the shares are worth £10¾.

Glen Deep.—Area, 182 claims, the deep level of the Glencairn and May Consolidated. The present 100 stamps will be increased to, probably, 200 in the course of a year or so. The first developments in this mine showed broken ground and reef of rather low value, but since then a notable change has taken place, and the mine is now considered by the best authorities as certain to have a successful future. Glen Deep.

Apparently, the Glen Deep lies in the centre of a large area of good ore, which, till a year ago, was not looked for in this particular locality. As it is, the lowest workings in the Primrose, May Consolidated, Glencairn, and Knight's outcrop mines all show good ore, and this extends down to the Rose Deep, Glen Deep, and Knight's Deep, showing even a better average in the deeps than in the outcrops.

A comparatively large area of the Glen Deep is taken up by two large dykes which pass through the mine. These do not dislocate the reefs seriously, but they are responsible for causing a big blank where reef should be, and this shortens the estimated life of the mine. It is difficult to accurately estimate the value of the shares. With 200 stamps at work, however, they should have an intrinsic value of £5.

Jumpers Deep.

Jumpers Deep.—Eventually, 200 stamps will be worked on this mine. The company owns 253 unworked ore claims, and has arranged to buy from the Jumpers Company, should that company be in a position to sell with a clear title, its twenty-eight bewaarplaatsen claims, for 36,662 shares.

The Jumpers Deep holds an asset of 44,828 Jupiter shares.

There are 600,000 tons of ore developed, all of which is estimated to yield 40s. per ton. The reefs are narrow on the whole, but the mine is a sound undertaking, and the results to date, with 100 stamps, have proved satisfactory.

The eventual capital will amount to about £570,000: 200 stamps should yield a profit of £200,000 a year, and on this basis the shares would be worth about £5.

Langlaagte Deep.

Langlaagte Deep.—Area, 184 claims on dip of Langlaagte Estate and Langlaagte Royal. For a considerable period after the reefs were struck in this mine the ore exposed gave very disappointing assays. For the last year, however, a much better average has been exposed, and the 800,000 tons developed may be expected to yield a return of from 28s. to 30s. The value of the shares is difficult to gauge, but it is not so much as the present market value.

Nourse Deep.

Nourse Deep.—Area, 198 unworked claims. This has been, on the whole, a disappointing mine. From its location, the dip of the rich Henry Nourse Company, it was expected to yield fully 15 dwts. to the ton. When the reefs were developed, however, it was found that the mine was not only badly cut up by dykes and faults, but that the ore was of a distinctly lower value than that in the outcrop mine. The unusually broken character of the ground is due to the formation, which from the surface to a vertical depth of 1,000 feet, lies at an exceedingly steep angle, suddenly flattening. Below this line of disturbance there is a slight improvement all through the mine, but, on the whole, the ground is still unusually badly faulted, and the average reef values do not come up to expectations. With an eventual 200 stamps, a yield of 36s. per ton might be possible, but it will be some time before the mine is sufficiently developed for this capacity.

There are 450,000 tons of ore now in sight.

The company owns 127,332 shares in the South Nourse, with a contingent liability on these of £127,332.

The exact value of Nourse Deep shares cannot be gauged for, I should think, at least two years to come.

Durban Roodepoort Deep.

Durban Roodepoort Deep.—Area, 227 unworked claims. This is a good mine with, however, limited capacities. There is at present only one reef worked, the South Reef, and the actual width of this is only an inch or two. As about 90 per cent. of waste rock has to be blasted down in mining the reef, it is essential that the ore should be most carefully sorted on the surface. This is being done, but, of course, working expenses appear correspondingly high. Owing to there being only one payable reef, and to the fact that it is extremely narrow, the mine, although it has a large claim area, will never be likely to support more than 100 stamps. At present there are sixty stamps, which will doubtless be increased. With 100 stamps, about 25 per cent. of the Main Reef, in addition to the South Reef, might be worked at a profit. This would give the mine a life of twenty-six years, a dividend of 25 per cent., and the value of the shares would be £2⅞.

Ferreira Deep.

Ferreira Deep.—Area, 142 claims. The claims now belonging to this company were subject for years to a series of lawsuits before they were finally accorded a clear title. Hence the delay in opening out what used to be estimated as likely to prove the richest area on the Main Reef. Actual development has now proved this estimate to be correct, as the ore opened up to date is of extraordinary good value. A profit of 50s. per ton is expected, and should the mine eventually be able to run 150 stamps, it would yield startling results. The whole area of the Ferreira Deep—a point of great importance—has been to a great extent proved by the workings of the Robinson Deep, and there is no doubt but that the shares will eventually be valued to yield a dividend, which on any other mining field would be looked upon as quite inadequate.

South Rand.

South Rand.—Area, 223 claims on dip of Crown Deep and Langlaagte Deep. This company was put on a capitalised basis five or six years ago, but no work has yet been done. The company recently acquired the thirty-eight deep level claims of the Pioneer, and will probably take in the eighty-one deep claims belonging to the Crown Reef. During the present year the ground in this neighbourhood will possibly be refloated into two companies, and shaft sinking will be commenced.

The shares have a considerable speculative value, as being favourably situated; but there is no knowledge of what the reefs may be like when cut, and, moreover, the ground is rather badly cut up, at least on the surface, by a big dyke running east and west through it.

Robinson Deep.

Robinson Deep.—In this mine there are about 208 unworked ore claims. The eventual stamping capacity will be 200 head, but the aggregate width of workable reef is not yet known, and it is, therefore, impossible to accurately estimate the life of the mine; probably the figure will be about twenty years. The property, in which about 300,000 tons of ore stand developed, promises to have a fine career, but the ore is apparently not so rich as in the Robinson, and is somewhat disturbed by dykes.

It will be impossible, until the 200 stamps have run for at least a year, to gauge the value of Robinson Deep shares as an investment. To return 7 per cent. interest on the present price of £13, together with redemption of capital invested, would require a regular monthly profit of £48,700.

Simmer and Jack West.

Simmer and Jack West.—The area of the property is 226 claims, on the immediate dip of the Geldenhuis Deep, but twenty-five of these will be sold to the Rand Mines Deep. The Main Reef series in this section of the Rand is unusually regular, with reefs of large width and good value. It may reasonably be inferred that the splendid ore bodies now worked in the Geldenhuis and Geldenhuis Deep will continue into the Simmer West, but, on the other hand, there is no *certainty* that such will be the case. The reef, when found, may be broken up, or a poor patch may be encountered. By the time this is in print the reef will, no doubt, have been cut in the deepest shaft. The shares are distinctly a speculation, but with every chance in their favour. Should the reef turn out well, a great enhancement in their value would probably ensue.

Simmer and Jack East.

Simmer and Jack East.—The property consists of 297 claims on the dip of the Rose Deep, and the company holds, in addition, 269,263 shares in the South Rose Deep, received for 162 claims sold to that mine. The reef was cut at under 1,900 feet, nearly 1,000 feet shallower than was estimated. The reason for this is assumed to be an upthrow, caused by a big fault, and the same phenomenon is expected in a number of the second-row deeps in this section of the Rand.

The development of ore in the Simmer East, so far, has proved most disappointing, in fact, many of the assays are so low that it has been surmised that the wrong reef is being opened out; unfortunately, however, this theory seems to be unwarranted. There is little doubt but that, eventually, the mine will be found payable, but in the meantime there will be a long delay in starting to crush, and a big expenditure on extra development. In addition to this there is the fact that one large patch in the mine is unpayable, a feature which may repeat itself, and the high capitalised market value of the company has now to be spread in consequence over a smaller claim area.

Shareholders in this mine should make a point of being well informed as to the results of development from time to time. Meanwhile, the shares are highly speculative.

Rand Victoria.

Rand Victoria.—This mine was floated in 1896. It has about 700 claims on the dip of the Simmer and Jack: £400,000 in cash: 45,000 shares in the South Geldenhuis Deep: 143,000 in the Rand Victoria East: and will sell about 400 claims for shares in the Rand Mines Deep. As yet, no attempt has been made to start shaft sinking, and it will be at least four years before any returns can come out of the mine. During that long interval we shall see many fluctuations in values of mining shares, and I have not the slightest doubt but that Rand Victorias will stand at a much lesser price than £3½. If the shareholder is prepared to lose interest on his money for four or five years: to see his shares go up and down a dozen times in the meanwhile: and, finally, to take the risk of possible disappointment when the reef is struck, I see no reason why he should not invest in Rand Victorias at £3½. Personally, the venture does not tempt me.

Rand Victoria East.

Rand Victoria East.—This is a similar undertaking to that just described. There are 273 claims: there is a working capital provided to the extent of £204,000. At £2 per share, the claims only stand at £2,800 each. All this looks well on paper; but, after all, banket mine as it is, the thing is purely speculative: to the speculator it may appeal, but I cannot recommend this class of mining venture to the investor.

Jupiter.

Jupiter is the deep level of Jumpers Deep. There are 488 claims, but a large number of these will be made over to the Rand Mines Deep, for shares in that proprietary company. The mine promises to be a success as it is situated in well located ground, but, of course, till the reef is cut, is simply a speculation. The deepest shaft is now down over 3,000 feet; theoretically, the reef should be found at 3,500 feet.

Knight's Deep.

Knight's Deep.—The area is 185 claims on the dip of the Witwatersrand mine, and it is proposed to erect an eventual stamping capacity of 200 head. This mine is developing distinctly well, and had it not been for delay caused by the striking of a heavy stream of water in one of the shafts, there would, by this time, have been a great deal of ore in sight. Apparently there is good average ore found in the workings from both shafts, which gives every promise that the average value all through the mine will be satisfactory. I cannot hazard an estimate of what profits will eventually be earned, but should the shares fall to £3 or £3½ they would be an attractive purchase.

South Geldenhuis Deep.

South Geldenhuis Deep consists of 193 claims on the dip of the Simmer and Jack. The ground is favourably located. It will take about £400,000 in addition to the working capital of £170,000 provided to completely develop and equip the mine. At £3 per share, adding the extra amount to be spent, the claims are valued at £9,500 each. The reef is expected to be cut at 2,500 feet.

South Rose Deep.

South Rose Deep.—Area, 265 claims on the dip of the Rose Deep and Simmer and Jack. When this mine was floated it took over a shaft which had already struck the reef at 2,290 feet. Since then, development from this shaft—the other shaft not yet having cut the reef—has been distinctly poor. This poor value of ore coincides with that found in the adjacent Simmer East mine, and points clearly to the fact that the Main Reef series in this locality, and at a depth corresponding to the areas of the second row deeps, contains large patches of poor ore, which were not expected. No doubt the South Rose will develop into a good mine, but the shares must still be classed as highly speculative. At £3½ per share, and including the additional cash that must be provided, the claims are valued above £7,000 each.

Robinson Central Deep.

Robinson Central Deep.—Area, 45½ claims, below the Robinson, and adjoining the Crown Deep on the east. A shaft is now being sunk. It is expected that this mine will contain very rich ore, and be equally as good as the Bonanza has proved to be. I do not think it will be so good as that mine, but no doubt the results will be such as to warrant a market valuation of at least £40,000 per claim, equal to £4¼ for the shares.

Village Main Reef.

Village Main Reef.—The unworked area at date is equal to 131 claims. In these the South Reef is found to be of high value, but the Main Reef Leader is narrow, and of poor quality. When the full equipment of 160 stamps is at work a larger quantity of Leader will be milled, but the profits will still be large. The life of the mine with 160 stamps should be sixteen-and-a-half years more, and including the value of 20,000 Wemmer shares held by the Village Company, the shares are worth £8.

Village Deep.

Village Deep.—This mine promises, theoretically, to be as fine a mine as the Village Main Reef. There is, of course, no certainty that this will be so, but the developments in the Robinson Deep, the adjacent mine, undoubtedly set a high value upon the area belonging to the Village Deep. There are 186 claims. An unworked Village claim to-day stands at £28,000, and if a Village Deep claim were valued only at £14,000 the price of the shares would work out to nearly £7.

A working capital of £190,000 has been provided, and the underwriters have a three years' option on 94,385 reserve shares at £5, which option will doubtless be exercised, and will produce £470,000, or £660,000 in all.

Bonanza.

Bonanza.—There are seven unworked claims. It will take the forty stamps belonging to the company five-and-a-half years from July, 1899, to extract this: the average dividend over this period should be 120 per cent., and the shares, to yield 7 per cent. and redemption of capital, are worth £5¼.

Angelo Deep.—There are 304 claims. Additional working capital must be raised to the extent of £450,000, and, assuming that this is done by issuing more shares at £4, the valuation per claim would stand at £7,200. This is a small figure when compared with the claim valuation of the Angelo itself, or the Driefontein, under which mines the Angelo Deep is situated, but, on the other hand, it is a heavy valuation for ground which, however well located, is as yet unproved.

Angelo Deep.

Witwatersrand Deep.—Two years of development work in this mine have exposed very little payable ore. Two reefs exist, but, as I have already stated elsewhere, these two reefs may be merely parts of one and the same reef which has been cut in two by a dyke. There have been several payable patches found, so far, on each of these reefs, but undoubtedly the aggregate result is most disappointing. These shares are only speculative counters as yet, and, on the results to date, stand at an absurdly inflated value. There are 276 claims.

Witwatersrand Deep.

Knight Central Deep.—The area of this property is 445 claims, and it is situated on the dip of Knight's Deep. A further sum of £450,000 will be necessary to equip and develop the mine. At the time of writing (March, 1899), the shaft has not yet struck the reef, and the shares are entirely speculative. Assuming a favourable strike, and the development of good or average ore, such as is now being found in Knight's Deep, the shares would probably go to £5.

Knight Central Deep.

West Roodepoort Deep.—This mine is one of the unfortunate deep levels. It is situated on the dip of two mines which are badly disturbed by innumerable small faults, and the same unpleasant phenomenon is repeated in this mine itself. The reef, as is the case in all mines in this locality, is a mere stringer, one inch thick. In the surrounding mines this one inch of reef is rich enough to allow of the inclusion of twenty-four inches of waste rock, and still leave a payable product, but in the West Roodepoort Deep, so far as developed, the assays apparently

West Roodepoort Deep.

do not average more than about 11 dwts. over a twelve-inch section, and as this would be reduced by one-half in actual stoping, the result must be considered unpayable. But there are 245 claims, and much of this area, no doubt, carries a better value of ore. I consider the shareholders would be well justified in raising £100,000 to be spent in further development of the mine, and, in fact, I would recommend them to pursue this course.

South Nourse.

South Nourse. Area, 300 claims, on the dip of the Nourse Deep. Working capital provided, £540,000. The shares are quite speculative, as the value of the property cannot be accurately gauged, but the financial position of the company is unusually sound.

City Deep.

City Deep.—Area, 190 claims, on the first dip of the City and Suburban, Meyer and Charlton, and Wolhuter. Working capital provided £210,000. Further amount necessary £300,000. Claim valuation at underwriting price £6,000. This area is not particularly well located, but the valuation is a legitimate one.

South City.

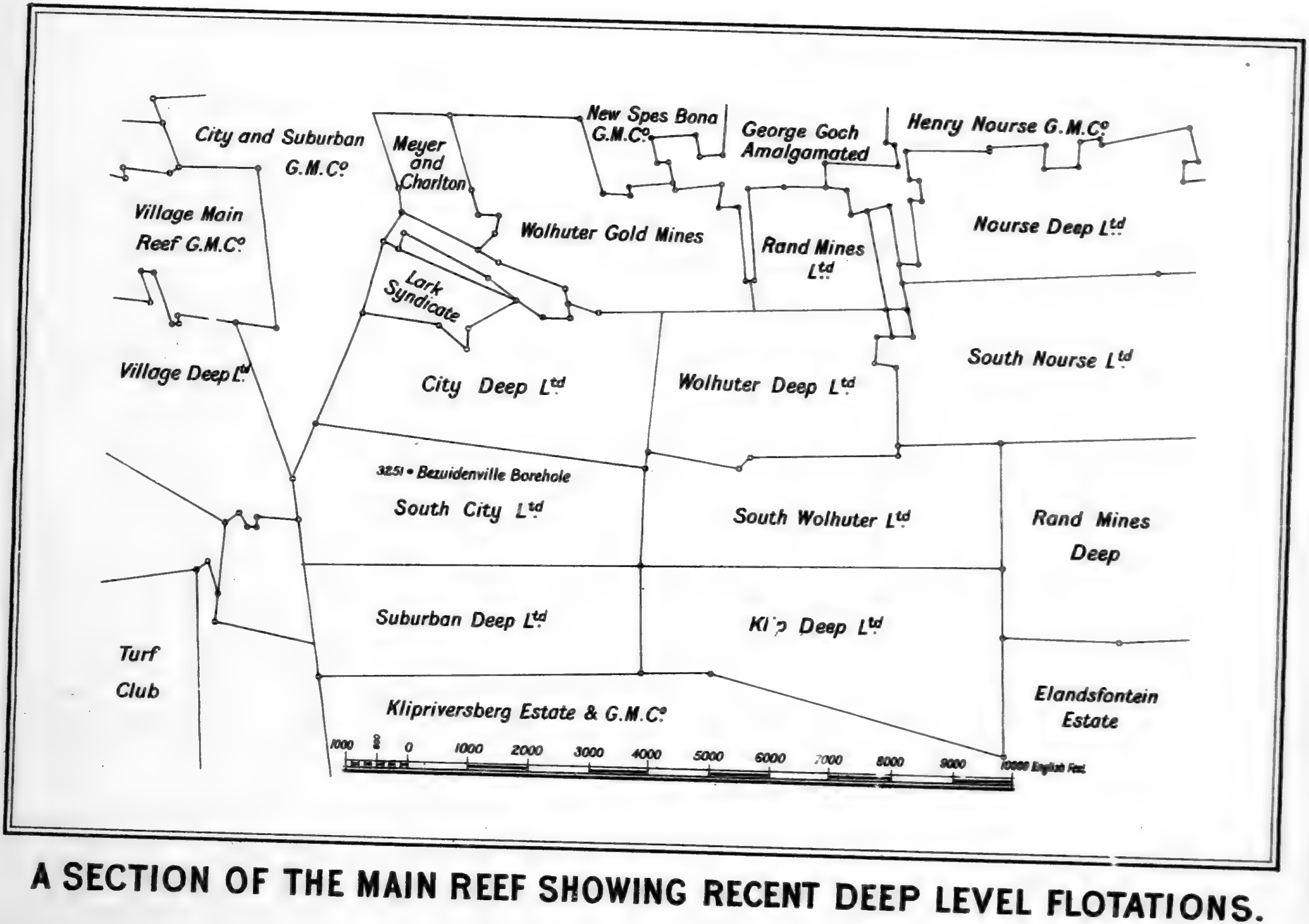
South City.—Area, 177 claims, on the dip of the City Deep, *i.e.*, on the second dip of the City and Suburban, Meyer and Charlton, and Wolhuter. The working capital provided is about £250,000. At the underwriting price the claims are valued at £5,500 each. Further cash will be required to the extent of £320,000. Near the centre of this property the Bezuidenville borehole cut the reef at 3,251 feet, and showing poor value, some four years ago. The shares are quite speculative.

Suburban Deep.

Suburban Deep.—Area, 160 claims, on the dip of the South City, *i.e.*, the third dip of the City and Suburban, Meyer and Charlton, and Wolhuter. Working capital provided £110,000. Further cash will be required to the extent of £500,000. At the underwriting price of £2 a share, the claim valuation works out at £4,700. The future is doubtful.

Wolhuter Deep.

Wolhuter Deep.—Area, 150 claims, on the dip of the Wolhuter, Spes Bona, and George Goch. Working capital



A SECTION OF THE MAIN REEF SHOWING RECENT DEEP LEVEL FLOTATIONS.

provided £231,250. At the underwriting price of the working capital, viz., £2 10s. a share, the claim valuation works out at £6,500. Further cash will be required to the extent of £270,000. The eventual success of this company is rather problematical.

South Wolhuter.

South Wolhuter.—Area, 192 claims, on the dip of the Wolhuter Deep, *i.e.*, the second dip of the Wolhuter, Spes Bona, and George Goch. The working capital provided is £175,000. The locality is unquestionably a doubtful one. The working capital shares are underwritten at £2½, which implies a valuation per claim of nearly £6,000. Further cash to the extent of £400,000 will have to be found. The ground appears to be decidedly over-valued.

Klip Deep.

Klip Deep.—Area, 233 claims, on the dip of the South Wolhuter, *i.e.*, the third dip of the Wolhuter, Spes Bona; and George Goch. The working capital provided was £150,000. At the underwriting price of the shares, the area works out at £3,200 per claim. A further sum of £450,000 will be required.

The reef must lie at a depth of 4,500 feet, it is probably very low grade, and the venture is highly speculative.

Driefontein Deep.

Driefontein Deep.—Area, 256 claims, on the dip of the Witwatersrand Deep, and on the second dip of the Western section of the Driefontein. This ground has only recently been put into company form. The working capital supplied was £250,000. No work has been done yet, but before the mine is fully developed £400,000 additional cash will have to be raised. The shares, as in the case of many of the deep levels, are pooled for two years, and presumably none will be sold under £2. The ground of the company is fairly well located, but the reef probably lies at a depth of 4,000 feet.

Cinderella Deep.

Cinderella Deep.—This company has not commenced work yet, although floated several years ago. The capital has been twice increased. There is now £400,000 cash in hand; this will be insufficient for eventual requirements by £250,000. The reef probably lies at a depth of over 3,000 feet, and, although the ground is in a fair locality, those who buy the shares to-day are discounting the future very considerably. There are 290 claims.

South East Rand Deep.

South East Rand Deep.—The claim area is 545, but on the extreme dip of the East Rand Extension and Boksburg properties, and as the Main Reef series has never been accurately located in these mines, or, if found in places, has been extremely poor, the property may be considered almost valueless as yet.

Kleinfontein Central.

Kleinfontein Central.—Area, 149 claims, on the immediate deep level of Kleinfontein. The reef in this property is, to a certain extent, proved by the borehole on the Chimes Mines—the deep level of the Kleinfontein Central. In all probability, to judge from developments in Kleinfontein, the reef will be low grade, and shareholders may not feel justified in providing the £450,000 necessary to equip and develop the mine. An amalgamation with Kleinfontein would probably be the most advantageous course, and with this in view Kleinfontein Centrals ought to be worth between par and £1½.

The company owns 19,548 Chimes West shares and £4,700 cash.

Chimes Mines.

Chimes Mines.—Area, 510 claims, on the dip of Kleinfontein Central. This company was floated three years ago, but except for the sinking of a borehole, which cut the Main Reef at 1,754 feet, assaying 10 dwts. for 36 inches, no work has yet been done. The company has £30,000 cash, and will require £600,000 more. Bearing in mind that the reef in this locality is distinctly low grade, and that the formation will probably be found to be broken, it is doubtful whether the controllers of this mine will ever supply sufficient funds to thoroughly prove it. The shares are a doubtful speculation.

South Village Deep.

South Village Deep.—Area, 180 claims, equivalent in their position to the fourth dip of the Wemmer. The reef will not be found at a shallower depth than 6,000 feet, and it will take £1,000,000 to develop and equip the mine. Cash on hand, or at call, £200,000. This is an example of the deep-level flotation we may expect whenever the public gets excited again. The deepest shaft in the world to-day, that at the Calumet and Hecla Copper Mine, in Michigan, has barely reached a depth of 5,000 feet, and yet here we have a weak financial group calmly floating a property which will require two shafts, each 6,000 feet deep, to work it, and providing not even enough money to sink the shafts—let alone to develop and equip the mine. I cannot see that the shares of such a company have any value.

Bantjes Deep.

Bantjes Deep.—Area, 448 claims, on the dip of the Vogelstruis Deep and the Bantjes, the latter a mine that has never yet proved good enough to warrant the erection of a battery. The reef lies at quite 4,000 feet deep, and it would take £800,000 to develop and equip the property. The company was provided with £100,000 working capital, most of which appears to have been expended in outside directions. The shares, to my mind, are worth nothing.

Langlaagte Block B Deep.

Langlaagte Block B Deep.—Area, 54 claims, on the dip of Langlaagte Block B. This area, low grade as it is, is sure to be too small to work as a separate mine, and should be amalgamated with the outcrop mine. It is not certain that the ore will be payable, but the shares have, doubtless, a speculative value of 30s. or so.

Vogelstruis Deep.

Vogelstruis Deep.—Area, 376 claims, on the dip of Vogelstruis Estate. The reef has been cut in two of the three shafts, and is now being developed. It is low grade, but in all probability certain sections will yield a profit when worked. The shares are still entirely speculative, but are not without intrinsic value. It is as yet too soon for investors to buy the shares. The company owns 11,400 Bantjes.

East Roodepoort Deep.

East Roodepoort Deep.—Area, 161 claims, on the dip of Kimberley Roodepoort. No work has as yet been done here. The company should have £120,000 in cash or at call. The future is doubtful.

Central Roodepoort Deep.

Central Roodepoort Deep.—This mine is turning out distinctly well. Its area consists of 190 claims, on the dip of Princess Estate. There is already a large quantity of payable ore in sight, and the company will in all probability pay regular dividends. The shares ought to be a sound speculation, even up to £3.

Steyn Estate.

Steyn Estate.—Area, 668 claims, on the second dip of Central and West Roodepoort Deeps. The reef probably lies at 3,500 feet deep, and it would take £700,000 to develop and equip the mine. Towards this there is £300,000 cash in hand. In addition the company owns an estate which yields a revenue of £7,000 a year from claim licenses. No work has yet been done, but boreholes will probably be put down to locate the reef. The shares are entirely speculative, but, owing to the size of the property, they have an attraction for speculators which theoretically better located mines fail to exert.

South Randfontein Deep.

South Randfontein Deep.—Area, 119 claims, on the dip of Porges Randfontein, and the block known as Stubbs Randfontein. The mine was floated several years ago with £50,000—less than one-tenth of the amount required—and no work has yet been done. The reef presumably lies at a considerable depth. Its value is very problematical, and the shares are a very poor speculation.

Lives and values of the most fully developed Rand mines.

As a summary to the foregoing description of all the mines on the Witwatersrand, I have compiled a table showing from the latest information available, the unworked claims, life, and value of the shares, of thirty of the soundest and most fully developed mines. The estimate shows what the value of the shares should be, allowing for 7 per cent. interest on the investment and ultimate redemption of capital.

These thirty mines I have divided into two groups. The first consists of those mines which are not only themselves fully developed, but which are surrounded by other deep-level mines. These can be valued with comparative accuracy, both as to their contents and probable profits, and, as 7 per cent. investments, are genuinely sound.

The second group consists of mines which are not so thoroughly proved by adjacent workings, especially by deep levels. These are nearly all sound ventures, but their capacity cannot be so accurately gauged as the mines in the first group, and as an investment, pure and simple, they cannot yet be classed with the others. It is only fair, however, to add that these latter mines may possess speculative possibilities which the more fully proved mines have not got.

Shareholders must allow for redemption of capital invested.

It will be seen from the following table that the public, even on the low basis of 7 per cent. interest, over-values some of these mines, while in many cases there is no margin of speculation left. Investors, apparently, cannot, and will not, make the necessary allowance for the redemption of their capital. For this condition of affairs the financial press, especially the subsidised portion of it, is largely to blame. Were I an investor, ignorant of mining knowledge, the impression I should gain from reading the financial papers of the day would be, that every area of banket is invariable in its characteristics, that every ton of it will yield the exact profits which the controllers of the mines state that it will—even for twenty years to come, and that the precise value of the shares, as an investment spread over ten or twenty years, can be ascertained in a moment by a simple rule of three calculation.

Absurd and highly inaccurate estimates of the values of banket mines are frequently circulated.

Absurd statistics of this sort are applied with the greatest impartiality to the very best mines, or to mines which, after ten years' exploitation, are still found by practical people to be unpayable.

This wholesale estimating of the values of Rand banket mines—many of which estimates are composed by persons who have never been in Africa—besides being dishonest, is hopelessly inaccurate. No account is taken of poor patches of ore, although these exist, as we have seen, in at least half-a-dozen mines where least expected: no allowance is made for the damage done, and the loss of ore caused by faults and dykes: no estimate is made of probable higher costs because of lack of native labour, or for stoppages caused by want of water, and yet these are ever present factors. These ideal estimates assume that the mine will produce a maximum theoretical profit every month until it is worked out, and that the shares are worth buying to yield 7 per cent. on this assumed profit; it is rarely that the life of the mine is taken into consideration at all.

Conditions for valuations vary in every mine.

As a matter of fact, there are no two banket mines in which the same conditions exist, and which are governed by the same factors. It is almost impossible to accurately value the mines which are fully developed, let alone those which have only been at work for a year or two, and which are little opened up.

The factors from which calculations can be made are continually changing. These changes are usually in favour of investors—but not always.

The most unfavourable factor.

The most serious factor, and one which shareholders must take full account of, is that, where least expected, broken ground, or patches of poor ore, may be found. As present examples, I will mention City and Suburban, Wolhuter, Nourse Deep, South Rose Deep, Simmer East, and Witwatersrand Deep. I am afraid that in the great area now being opened up by the deeper deep levels, many of these poor patches will be found, and in the face of such eventualities I consider the excessive speculation, and the absolute trust shown in the future of all these undertakings, is unwarranted. No doubt, as a whole, the deep levels will prove highly successful, but there are distinct risks to be undertaken before all of these mines shall have been proved payable, and a certain number of comparative failures will surely result.

The most favourable factors.

In the investors' favour we have the following factors:—

Erecting more stamps.

1. The policy of erecting more stamps, whenever the labour supply admits of it, is being generally carried out. By this means the total profits from the mine are returned more quickly to the shareholders, whose investments appreciate in value accordingly.

Working lower grade ore.

2. With larger stamping capacity working costs are lowered. This enables the management to mine at a profit large quantities of low grade ore which would otherwise be left behind as unpayable.

3. It has been found, in practice, that 12 cubic feet of ore weigh one ton. All previous calculations of "lives" allowed for 13 cubic feet, and to this extent the lives of all mines have been underrated by about 8 per cent.

12 cubic feet to a ton—not 13.

4. Calculations of tonnage per claim are either made on clean ore, or on a theoretical stoping width of 36 inches. In actual mining, however, a considerable additional amount of waste rock is blasted down with the ore, and, despite the closest sorting, the tonnage milled always includes more waste than is allowed for in the estimate of ore in sight. This fact adds considerably to the life of the mine.

Waste rock and ore-sorting.

5. Between now and the time when most of the present dividend-paying mines shall have become worked out, further reductions in working costs may be reasonably expected. These reductions will not, I assume, be the result of political developments, in fact they will be rendered void to some extent by the recently levied tax of 5 per cent. on profits, but, on the whole, the balance will be in favour of investors.

Working costs gradually being lowered.

6. Many of the mines have now large reserves of ore developed which have been paid for out of current profits. During the last three or four years of the life of these mines, not only will capital expenditure entirely cease, but these large sums, so locked up, will become available for extra dividends.

Ore reserves are already paid for.

7. When a mine becomes exhausted it will be possible to take out, and at very small cost, most of the ore now left in for pillars and such like. This will mean six or twelve months' work for many of the mines.

Pillars will be worked.

It remains to be added that, in the following estimate of lives and values, all these favourable factors have been taken due notice of. The eventual results may, in individual cases, be very slightly better than what I have estimated, but I do not think that investors would be justified in assuming that such will really be the case.

TABLE SHOWING THE ESTIMATED INTRINSIC VALUE OF THE SHARES OF THIRTY OF THE MOST FULLY DEVELOPED WITWATERSRAND MINES.

Basis—7 % interest on capital invested, plus redemption of capital at 5 % compound interest.

Name of Mine.	Unworked ore claims at 1 7 99.	Number of stamps crushing at 1/7/99.	Estimated life of mine at 1/7/99.	Probable average annual dividend.	Estimated value of the Shares.								
					Value on mine dividends.			Value on other assets.			Total value of the shares.		
A				%	£	s.	d.	£	s.	d.	£	s.	d.
Bonanza	7	40	5½	120	5	5	0		—		5	5	0
Crown Reef	25	120	5	240	9	10	0	6	5	0	15	15	0
Durban Roodepoort ...	45	80	6	125	5	15	0		—		5	15	0
Ferreira	32	80	11	300	21	10	0	5	0	0	26	10	0
Geldenhuis Estate ...	27	120	6½	170	8	5	0		10	0	8	15	0
Heriot	39	70	13	100	8	0	0		—		8	0	0
Henry Nourse	22	80	7	170	8	15	0	1	15	0	10	10	0
Jumpers	13	100	6	110	5	0	0	3	0	0	8	0	0
Jubilee	6	50	7	100	5	5	0	2	12	6	7	17	6
May Consolidated ...	26½	100	10½	75	5	5	0		—		5	5	0
Primrose	55	160	15	60	5	2	6		—		5	2	6
Robinson (£5)	99	200	14	23	9	10	0		10	0	10	0	0
Salisbury	9½	50	6½	40	2	0	0	1	12	6	3	12	6
Treasury (£4)	22	50	13	18	5	15	0		5	0	6	0	0
Worcester	2½	40	3	60	1	12	6	1	15	0	3	7	6
Wemmer	24	60	7½	190	10	5	0	4	10	0	14	15	0
B													
Champ d'Or	6	50	4½	50	2	5	0		—		2	5	0
City and Suburban (£4)	128	160	20	15	6	0	0		7	6	6	7	6
Crown Deep	157	200	18½	120	11	10	0	1	15	0	13	5	0
Durban Deep	227	100	26	25	2	17	6		—		2	17	6
Geldenhuis Deep ...	188	200	20	100	10	0	0		—		10	0	0
Ginsberg...	33½	50	13	35	2	15	0		—		2	15	0
Glencairn	89	160	16	30	2	15	0		—		2	15	0
Langlaagte Estate ...	54	200	16	35	3	2	6		10	0	3	12	6
Meyer and Charlton ...	23	80	10	85	5	15	0		15	0	6	10	0
Rose Deep	171	200	24	100	10	15	0		—		10	15	0
Roodepoort U.M. Reef...	82	110	8	60	3	10	0	1	10	0	5	0	0
Simmer and Jack (£5)...	342	320	19	7½	3	15	0	1	15	0	5	10	0
Village Main Reef ...	131	160	16½	80	7	5	0		15	0	8	0	0
Wolhuter (£4)	136	100	45	10	5	5	0		7	6	5	12	6

Debenture issues.

The debenture issues of Witwatersrand mining companies form a series of sound investments, and may be recommended with safety.

In nearly every case the debentures carry an option to be converted into shares up till a certain period, and debenture holders already stand to make handsome profits on many of these options.

In fact, as a result of the recent rise in share values, nearly all the options will have been exercised; and most of the debenture issues will be at once cancelled. Already the debenture issues of the Robinson Deep, Angelo, Driefontein, and Van Ryn, have been thus paid off.

It is possible that the invariable success of Rand debenture issues, to date, may lead to the issue of such by mines with less assured futures. The public must take note of this point, but with regard to nearly all those already issued there is little risk.

TABLE OF DEBENTURES

Issued by Witwatersrand Mining Companies (exclusive of the Debentures wholly converted into shares under terms of option).

Company.	Amount issued.	Rate of interest.	With option to convert into shares		Redemption.			
					By annual drawings.			Or in payment (after giving six months' notice) at
			at	up to	No. of drawings.	from	at	
	£	%	£					£
Witwatersrand Deep ...	100,000	5½	2½	June, 1900	15	1901	100	105
Do. do. ...	100,000	5½	3	„ 1901	15	1902	100	105
Vogelstruis Deep... ...	122,500	6	1¾	„ 1900	10	1902	100	105
Treasury	54,000	6	—	—	10	1901	103	105
Vogelstruis Estate ...	100,000	6	2	Dec., 1900	—	—	—	—
Glencairn	140,000	6	3½	Feb., 1900	7	1901	102	—
Knight's Deep	400,000	5½	4	June, 1900	15	1902	100	103
Kleinfontein	100,000	6	3	Mar., 1900	8	1902	100	105
Geldenhuis Deep ...	128,000	5½	—	—	8	1899	100	—
Durban Roodepoort Deep	200,000	6	4	Mar., 1900	10	1899	100	105
Simmer and Jack... ...	293,000	5½	—	—	15	1900	100	105
French Rand	200,000	6	2	Dec., 1899	10	1900	100	100
Simmer East	500,000	5½	4	„ 1900	15	1902	100	103
New Comet	175,000	6	3½	Aug., 1900	8	1900	100	105
Lancaster	180,000	6	3½	Jan., 1902	10	1902	108	-
Consolidated Main Reef...	120,000	6	2½	Dec., 1900	12	1902	103	105
Roodepoort Central Deep	150,000	6	2½	„ 1900	12	1901	110	—
Jupiter	400,000	5½	4	June, 1901	15	1903	100	103
Princess	60.000	6	3	May, 1901	12	1901	108	—
New Chimes	41,000	7	1½	Dec., 1901	4	1902	105	105
Luipaard's Vlei	150,000	5½	1⅛	„ 1901	20	1902	100	103
West Rand Mines ...	160,000	5½	1½	Mar., 1902	20	1904	100	103

Outside districts of the Transvaal.

A very distinct line must be drawn by speculators between the Witwatersrand and its mines, and the mines of all the other districts in the Transvaal.

The principal of these districts are Heidelberg, Klerksdorp, De Kaap, Lydenburg, and the Murchison. I have visited all of these, some of them repeatedly, during the last eight years, and have witnessed many illustrations of the danger of sinking capital in them.

Heidelberg.

To begin with, we will take Heidelberg.

Since the earliest days of the Rand, when the different series of banket beds were found dipping to the south, it was known that at Heidelberg, thirty miles distant, there were also banket beds—dipping to the north.

Geologists have assumed, with perfect reason, that these beds form the other side of the great basin which at this particular locality, that is to say, between Johannesburg and Heidelberg, is thirty miles wide, but which is also known to extend 100 miles distant to Klerksdorp, and into the Orange Free State. The banket beds at Heidelberg are therefore, probably, of the identical Rand formation, but it does not follow—and it is so hard to convince would-be company promoters of this—that these reefs, lying on the other side of the basin, carry equal quantities of gold, or lie as regularly as do those on the Witwatersrand.

Periodical flotations.

A great number of mines have been floated in the Heidelberg district from time to time. Whenever there is anything approaching to a "boom," a dozen or two dozen mines are floated. Time passes. The mines are found worthless, their money is all spent, and they are shut down. Then they lie idle for years until the next "boom" comes, when they are pumped dry and refloated, and the same process takes place again. In the 1895 "boom" the Consolidated Gold Fields took up extensive interests in the district. Thousands of claims were acquired at high prices. The Nigel Deep, Nigel Central Deep, and Sub-Nigel, were floated, and the district rose in the estimation of the ignorant. To-day, what is the result? The Nigel Central

Deep and Sub-Nigel are shut down, many of the claims are abandoned, and the Nigel Deep, a mine over which hundreds of thousands of pounds have been squandered, has just started, after four years, to mill with twenty stamps.

Nigel.

All these twelve years there has only been one good mine in the Heidelberg district—the Nigel mine—and it is on the success of this one small rich patch that dozens of worthless mines have been floated, and hundreds of thousands of pounds lost.

The **Nigel** Company, with an issued capital of £200,000 and £60,000 debentures, was a rich mine in the early days—the richest banket mine in the Transvaal—and during the years 1891-4 did especially well. Then poorer ore was encountered; development fell behind, and for several years the mine remained under a cloud. No dividends were paid, and the shares fell to a very low figure. During 1898, however, in several parts of the mine, a large quantity of highly payable ore was opened out; these chutes have continued to develop well, up to the present, and to-day, it may honestly be said that the Nigel is a better looking mine that it has been at any time during the last five years. The management is sound.

Large ore reserves.

There is now a big ore reserve, handsome profits are assured for some time to come, and the present thirty-stamp mill is being increased to fifty head. It is conceivable that the Nigel will earn a 40 per cent. dividend, from ore in sight for some years to come. The area of the mine is large, the continuance of the rich chutes through the entire depth of the property is now assured by the discoveries in the Nigel Deep, and it is probable that the Nigel will be a steady dividend payer for many years to come.

But the three or four rich chutes in the Nigel mine, although they probably continue in depth, only occupy a very small area, while for miles around the country is floated off into companies. The Nigel Deep, and perhaps the Nigel Central Deep will contain, it seems to me, all or any continuation of rich ore found in the Nigel. Below these again, but at a great depth, the rich ore may be found continuing into the farm Grootfontein, which is controlled by the Consolidated Gold Fields.

Poor mines in the Nigel district.

On each side of this good run of ground, which a mass of prospecting and development work during the last twelve years has shown to be the only payable ore in the Heidelberg district, there are a number of mining companies.

On the west there are:—

French Western Nigel.
Sub-Nigel.
Ryan.
Romola.
Florida.
North Florida.
South Florida.
West Nigel.

On the east are:—

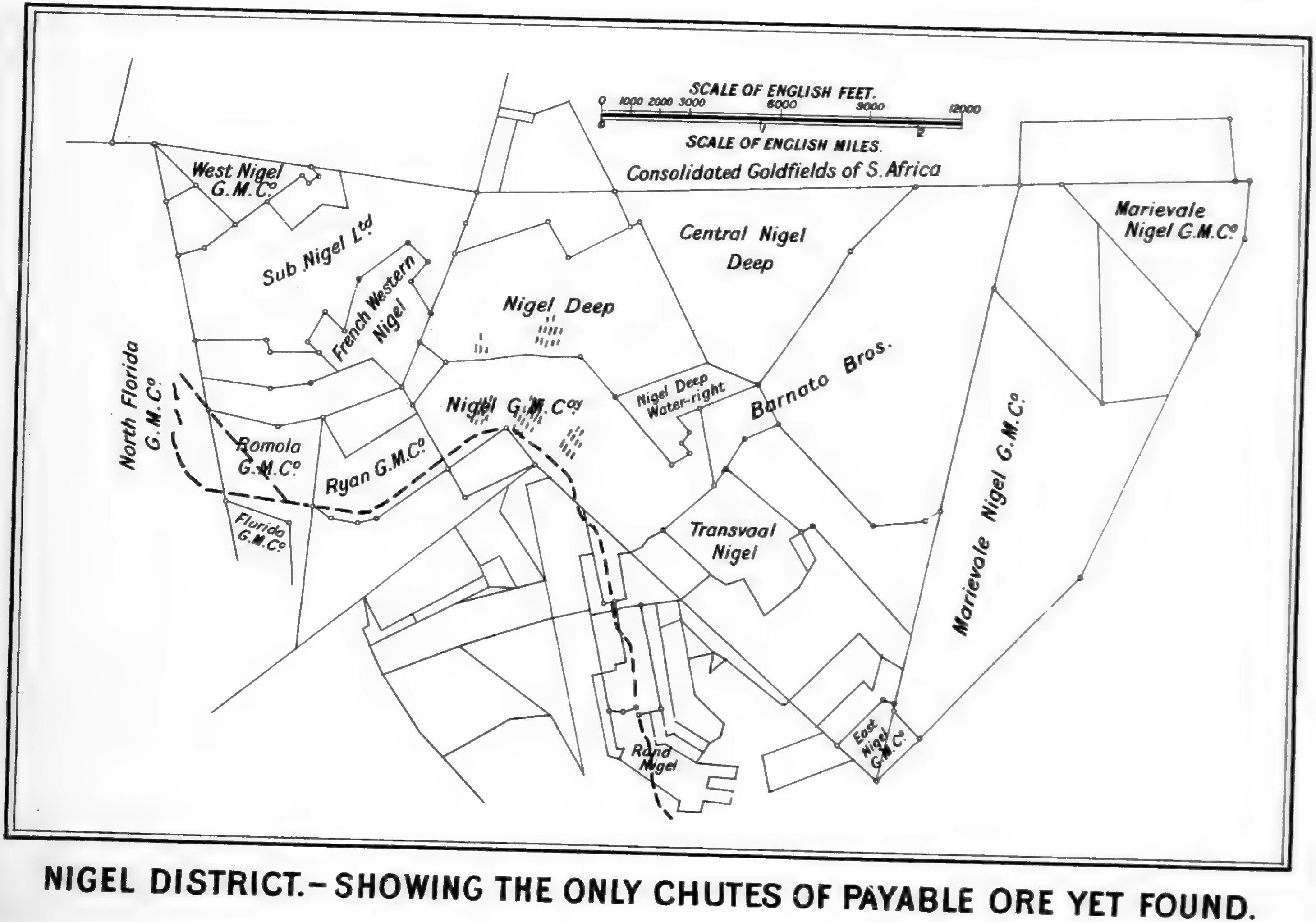
East Nigel.
Rand Nigel.
Transvaal Nigel.
Henderson's Nigel.
Marievale Nigel.
South Nigel.
Nigel Extension.
Nigel Main Reef.

In the aggregate a great deal of work has been done by these badly located mines, but they have, one and all, entirely failed to show themselves payable. Reefs certainly exist in all of these mines, but they are narrow, patchy, and frequently badly broken.

Some of these have funds in hand.

A number of these mines have a good deal of cash in hand.

Sub-Nigel, with an issued capital of £300,000, has in cash or good assets, about £75,000.



NIGEL DISTRICT.—SHOWING THE ONLY CHUTES OF PAYABLE ORE YET FOUND.

French Western Nigel has £45,000.

Transvaal Nigel, with £275,000 capital, has £20,000.

Florida, capital, £162,500, has £65,000.

North Florida, capital, £125,000, has £20,000.

South Florida, capital, £125,000, has £20,000.

Returning now to the two mines which may be assumed to contain within their area the continuation of the Nigel chutes—viz., the Nigel Deep and Central Nigel Deep, we find the following facts.

Nigel Deep.

Nigel Deep.—Issued capital, £450,000.

This property extends to 659 claims, and probably contains within its area the continuation of all the Nigel chutes. But there are also, as development has clearly shown, large areas of poor reef and of broken country, and the sum spent to date in developing these barren sections, as compared with that spent in opening out good ore, has been unusually large. On the whole, the ground opened to date in the Nigel Deep, a considerable area, is decidedly not so good as an equal area of the Nigel, and to me, it seems probable that the deep-level mine, even should it improve on its results to date, will never equal the outcrop.

At a recent date there were 102,000 tons of better class ore developed in Nigel Deep. This figure was arrived at by assuming a stoping width of one foot. The value of the ore developed, according to the last report of the Consolidated Gold Fields, was 43 dwts. This, however, was the value of the clean ore, which was only 6·2 inches thick, so that the value of the 102,000 tons is really only about 22 dwts., equal to a recovery value of about 1 oz. The statements contained in the Consolidated Gold Fields report for 1898 that (1) there were 102,000 tons in sight, and (2) that the value of the ore was 43 dwts., were therefore misleading.

The Nigel Deep is a fairly good mine, so far as it is developed, and in a year or two will probably have a lot of payable ore in sight. In the meantime, for a year at least, it will be inexpedient to run more than twenty stamps, and a monthly profit averaging £5,000 is, to my mind, the most that can be expected for some time to come.

Nigel Central Deep.

Nigel Central Deep.—Issued capital, £200,000. There are 548 claims, on the dip of the Nigel Deep. Several shafts on the property, after being shut down for a year or two, are now being continued. The reef will be cut at about 1,500 feet. It is reasonable to assume that the rich Nigel ore will continue in the direction of the Central Nigel Deep, but the property is in still a speculative stage. There is already a debt of £55,000, and before long the company will have to be reconstructed.

This completes an account of the Nigel district. Let it be remembered that in all probability there is just one rich patch in the district. This extends from the Nigel, a really good mine, into the Nigel Deep. Here it averages, apparently, a lesser value, but is still good. In depth the same class of ore may be expected in the Nigel Central Deep—but this is purely speculative.

Outside of these properties the shares of all Nigel Mines are, in my opinion, simply gambling counters, and should be regarded accordingly.

Molyneux Mines.

Some distance from the Nigel district is the ground that belonged to the Molyneux Mines. Several years' development of this mine only produced 18,000 tons of payable ore. In addition to this the reef in all the lower workings was much broken up, and a series of boreholes, put down on the dip, failed to discover any reef at all. Notwithstanding these facts, which I gathered from an inspection of the mine, and also from the information placed at my disposal by a late manager of the property, the press and public were deceived by those most interested, and shareholders lost heavily. The company went into liquidation; the ground was bought for a mere nothing, and has now been refloated as the Nigel Proprietary, capital, £65,000. On the same line of reef a lot of other mines, equally bad, were floated—Blinkpoort, Molyneux West, Heidelberg G.M., Heidelberg Estates, etc. All these mines have been, or ought to be, liquidated.

Heidelberg Roodepoort. Hex River.

In another part of the Heidelberg district are the Heidelberg Roodepoort and Hex River mines.

Heidelberg Roodepoort, after spending £150,000 in a fine equipment, started in 1896 to mill with forty stamps. After mining for about a year, at a loss, the mine was shut down. There is a debt of about £80,000. The ore is unpayable.

The same remarks as to ore value apply to the Hex River.

Should the present "boom" last till the end of this year, the whole of the mines at Heidelberg will be refloated under different names, and, with the help of English capital, given another trial.

Klerksdorp.

Klerksdorp is about 100 miles south-west of Johannesburg, and lies close to the border of the Orange Free State. During the exciting days of 1887-90, dozens of mines were floated on the numerous banket reefs that exist here. These all came to grief. The reefs at Klerksdorp, while fairly regular in occurrence, are invariably low grade, yielding from 4 to 7 dwts. It is quite possible that at some distant date these reefs may be worked to pay expenses, but the question is one which need not trouble investors; there could never, to my mind, under any circumstances likely to exist for many years to come, be a margin of profit sufficient to attract outside capital.

"Boom" flotations.

In the "boom" of 1895, all the earlier floated mines, which had been lying for years unworked, were refloated, and a large number of new mines were added to the list. So keen, for example, was the competition to secure ground for flotation in England, that a block of claims that I had held in 1893, and had abandoned after proving their worthlessness by boring, was floated in 1895 for £225,000, as the Southleigh Mines, Limited.

"Eastleigh" reef.

On the "Eastleigh" line of reef, the success of the Eastleigh Mines, which consisted in the fact that the mine was worked

Eastleigh Deep, Eastleigh Block A, Westleigh, Southleigh, Ariston.

for two years without losing money, caused the flotation of the **Eastleigh Deep, Eastleigh Block A, Westleigh, Southleigh,** and **Ariston.**

It may be news to the directors of such of these companies as have not yet gone into liquidation, to learn that, at a certain depth, the "Eastleigh" reef, which near the outcrop is a well defined banket body, becomes a large mass of almost "bastard" reef matter, carrying pebbles only here and there, and worth less than 2 dwts.

This fact I ascertained in 1893, from boring on the claims now belonging to the Southleigh, and I see the same thing referred to in a clever book on the Klerksdorp district, published about two years ago.

Eastleigh.

The **Eastleigh** has a considerable amount of ore developed which would probably pay for treatment if the mine were equipped with the best machinery. There is only one principal chute of ore, however, and as, at any moment, this may turn, in depth, into bastard reef, there is considerable risk in putting up the £100,000 necessary to pay off the company's debt, and to provide the machinery required.

The other lines of reef, do not, apparently, show this unpleasant feature—that is to say, of a banket reef, well defined at the outcrop, turning into a "bastard" reef in depth. But they are invariably low grade and have never yielded consistent profits.

Klerksdorp G. M.

The **Klerksdorp G. M. Company** is periodically reconstructed, and is, apparently, always on the point of starting a dry crushing process which is to be a great success. I should be surprised if this mine worked at a profit for six months consecutively.

Afrikander.

The **Afrikander** is a property which infatuated shareholders in England will not consider as unpayable. As a matter of fact a careful inspection of the mine showed me that there was a chute of fairly good ore, about 300 feet long, but all the rest is low grade. This chute is only big enough to yield profits on a very small capital—besides there is no guarantee that the chute will continue in depth. These are poor assets on which to buy shares, and on the first spurt in the Afrikander market shrewd speculators should sell out.

Niekerk.

The **Niekerk** is a mine that has been much puffed from time to time in the English financial press. As the mine appeared, from assays frequently published, to be opening out so remarkably well, it is curious that the directors should have turned their energies, and what is much more important, the company's cash, to the acquisition of a block of claims on the Main Reef at Johannesburg. The latter asset, as a matter of fact, is probably more valuable than the mine at Klerksdorp, but in any case the public should most carefully avoid Niekerk shares.

Klerksdorp Proprietary, Southern Klerksdorp, Rietkuil, Wolverand, Palmietfontein.

Klerksdorp Proprietary, Southern Klerksdorp, Rietkuil, Wolverand, Palmietfontein mines—all come under the usual Klerksdorp category of low grade properties. There is no reason to think that these mines are payable.

Buffelsdoorn A, Buffelsdoorn Central, Buffelsdoorn Consolidated.

In the Buffelsdoorn district, the Buffelsdoorn mine itself is still at work, but the **Buffelsdoorn A, Buffelsdoorn Central,** and **Buffelsdoorn Consolidated,** having failed to find any payable ore, are shut down.

Buffelsdoorn.

Buffelsdoorn, with an issued capital of £550,000, and a debt of £350,000, has been one of the notorious mines of the Transvaal. With its enormous debt, combined with the fact that the most strenuous efforts of the management only suffice to earn enough profit monthly to pay interest due, there is little hope that present shareholders will ever get anything out of the mine. And, yet, how easily this present hopeless condition of affairs might have been averted.

Historical.

In 1895 the company received for its Buffelsdoorn A shares £400,000 in hard cash. With heavy undertakings for machinery and development in view, combined with the fact that the mine had never paid a previous dividend, a sound engineer and careful directors would have decided to keep this money in hand for the company's heavy future requirements.

But the Board at once proceeded to pay away the whole £400,000 in the shape of an 80 per cent. dividend. As a matter of fact, this distribution was called a "bonus" not a dividend, but the result to the company was the same. Since then nothing but misfortune has pursued the company. When the large mill of 140 stamps commenced crushing there was a heavy debt. For months, almost for years, operations were carried on at a loss, and even now, when only a few stamps are being worked on picked ore, the monthly profit barely suffices to pay the monthly interest on the debt.

It really does little good to criticise adversely a mine such as the Buffelsdoorn. The events alluded to happened some years ago, and shareholders have doubtless realised their position long ere this. The lesson that should be drawn from it, however, on the part of investors is, to beware of the state of things brought about during a "boom." (Since the foregoing was written it has been proposed to reconstruct the company.)

Potchefstroom district.

In the Potchefstroom district, adjoining Klerksdorp, there are one or two unimportant mines, now shut down. These are Potchefstroom Exploration, Amazon, Venterskroon, and Rooderand.

Rooderand.

Rooderand is situated in the Orange Free State; it possesses a large area, £50,000 in cash, and numerous reefs which are unpayable.

None of the mines in the district are worth attention.

De Kaap district.

The De Kaap district, of which Barberton is the headquarters, lies 200 miles east of the Rand on the borders of Swazieland.

In 1884-5 the discovery of gold at Moodie's, a mountain range close to the present town of Barberton, brought about a rush from all parts of South Africa to the district. In 1886 the rich patches of ore discovered in the neighbouring mountains, notably at the Sheba, led to the arrival of a number of capitalists from Kimberley—the then financial centre of South Africa—and a "boom" was inaugurated.

Early in 1887, this being the first of my five journeys to South Africa, I found myself, after a two months' journey in an ox waggon from Natal, as a sightseer only, in the picturesque mining camp of Barberton, then at the zenith of its prosperity.

Since those days De Kaap has slowly but surely proved itself a failure as a gold field.

Geological.

The reefs, some of quartz, others, such as the Sheba, apparently of quartzite, are entirely different in their nature from those of the Rand. They run through the mountain ranges with wonderful regularity, cropping out here and there in rich patches of gold. These patches rarely continue in depth, and mine after mine has started on such a patch only to shut down finally after a few months' work.

De Kaap is entirely discredited at the Rand. In England, mainly on the success of the Sheba, it has always been held in better esteem, and the 1895 "boom" resulted in the flotation, on previously abandoned ground, of a large number of new companies. Not one of these companies has as yet been a success.

The district a failure.

Of about forty mines in existence, or recently in existence, at De Kaap, there is only one, the Sheba, which has ever attained the position of a permanent mining enterprise. I have no wish to make the position of De Kaap seem worse than it really is. Perhaps the district has never had a fair trial, and even now there may be five or six small mines which may be brought to a regular profit-earning stage; but one must be guided by facts.

It is now fourteen years since the district was opened up. A large amount of capital has been from time to time laid out in all sorts of mining ventures, and the aggregate result has been almost invariable failure.

I append some notes about individual mines in the De Kaap district.

Sheba.

Sheba.—Issued capital, £1,075,000.

The past history of this mine entitles it to the position of one of the notable gold mines of the world. Briefly described, the mine consists of a wide reef of quartzite, dipping at 45 degrees, and carrying one main chute of rich ore which has been proved to 1,500 feet on the incline. In many places, notably on levels 7, 8 and 9, the chute ore has been of exceptional richness, perhaps averaging 2 ozs. per ton, and of a dimension of 100 feet long, and 60 feet wide. But the chute has been irregular in value, and there is no disguising the fact that all the ore opened up below the 16th level (the shaft is now down to the 19th) has been unpayable.

The value of the ore.

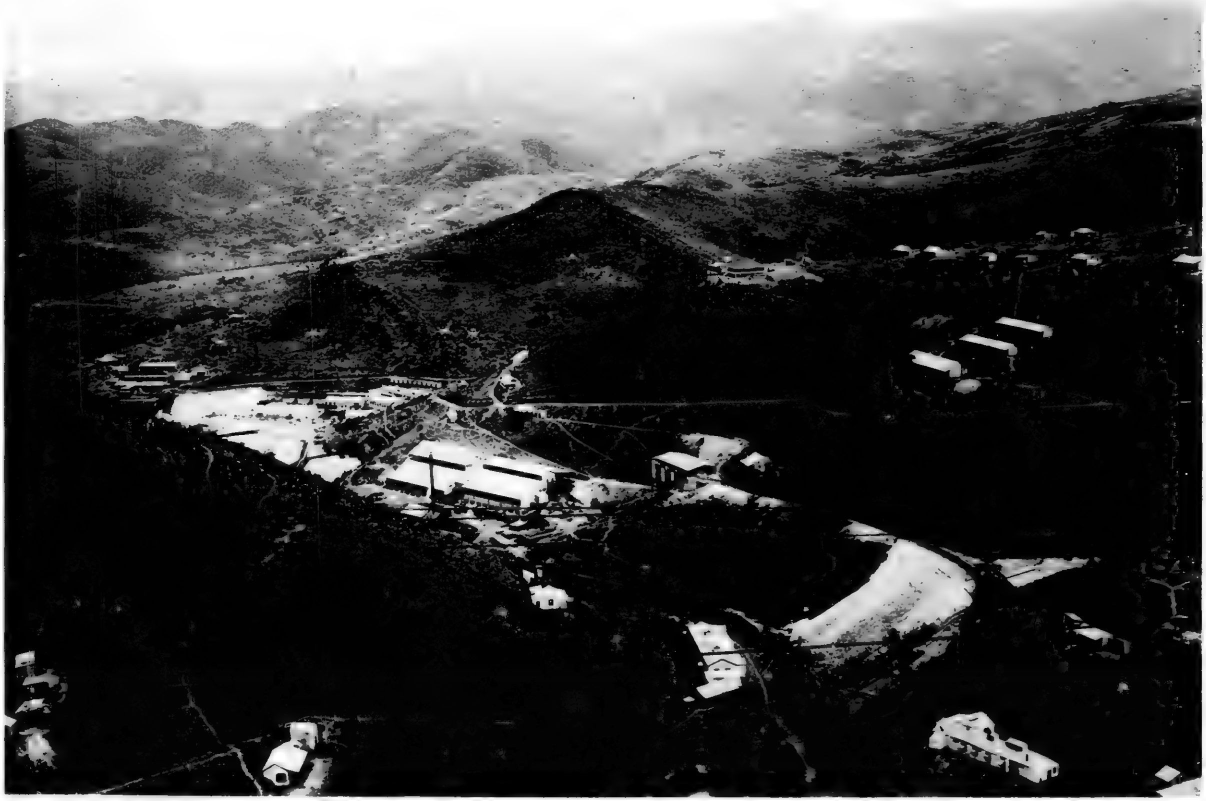
In the upper levels nearly all of the rich ore has now been worked out. The mill is being increased to 200 stamps, and on this basis there is quite five years' ore in sight in the mine; but it is distinctly low grade, and probably will not average more than 48s. per ton recovery value. In addition to this I consider that all the rich ore in the Zwartkopje claims has now been worked out, and I look on this particular mine as of no further value. The Oriental and Edwin Bray claims continue to yield a certain amount of payable but low grade ore.

Various theories have been put forward to account for the recent falling off in the returns from the Sheba, but I am convinced that the only explanation is that the mine has now become a low grade property, and promises to continue so for a long time to come.

A chute of ore which has continued rich, for 1,500 feet in depth, even a quartzite vein, may logically be expected, even after a temporary falling off in value, to again become rich at a still greater depth. This view of the case will no doubt be taken by many Sheba shareholders.

A real improvement in the bottom of the mine would be welcomed by mining men all over South Africa, and, of course, would have a most important effect on the intrinsic value of the shares.

Taking hard facts into consideration, however, and ignoring problematical discoveries, my opinion is that Sheba shares, as an investment, are not worth anything like their present price of 35s.



SHEBA MINE.

United Reefs (Sheba).—Generally known as Joe's Luck, said to be improving in depth. I have not inspected the mine. There are fifteen stamps, and a cyanide plant at work.

United Reefs (Sheba).

The **United Ivy Mine**, on Moodie's mountain, has, from time to time, paid small dividends under careful management, but these have ceased for some years now. There are two small chutes, on different reefs, which have been followed down a considerable distance. I am afraid there is no reason to think that much improvement can be expected.

United Ivy Mine.

The **Woodbine**, also on Moodie's, is a "small chute" mine. Recently a large sum was spent in equipping it with a fine plant, and twenty heavy stamps. No very good results can be looked for.

Woodbine.

There are a few more mines at De Kaap, and in Swazieland which, so far, cannot be considered to have been proved unpayable. These are:—

Some possibly payable De Kaap mines.

Woodstock.
Clutha.
Sheba Queen.
Royal Sheba.
Consort.
Albion.
North Sheba.

I cannot hold out hopes to the shareholders in any of these seven mines that they possess a really sound property, but from an inspection (although not very recent) of several of these, together with information gathered about the rest, I think that careful and economical development, to a certain extent, is justifiable: it is not justifiable, however, to yet think of erecting stamps for any of these mines.

The remaining De Kaap properties, in my opinion, have little or no prospects, and need not be dealt with here.

The Lydenburg district is, on the whole, the most important district in the Transvaal after the Witwatersrand.

Lydenburg district.

At Heidelberg, Klerksdorp, and Potchefstroom, there are banket reefs: at De Kaap quartz lodes: while at Lydenburg the reefs are stratified veins, of water formation, and entirely different from either of the foregoing.

These reefs, lying nearly flat, run through the mountains, and the outcrop can frequently be attacked from all sides simultaneously. The reefs are usually narrow, and frequently irregular in value, they are difficult to mine, and, on the whole, have proved disappointing.

From 1871 onwards for a number of years, Pilgrim's Rest, the most beautiful spot in the Transvaal, now the centre of reef mining of the Lydenburg district, was a flourishing alluvial field, and supported hundreds of diggers. For some time, however, this industry has practically ceased, and has been superseded by the more prosaic reef mining.

Transvaal Mining Estates.

Since its commencement as a gold field the best mine at Lydenburg, or rather at Pilgrim's Rest, has been the Transvaal Gold, now known as the **Transvaal Mining Estates**. Here a number of reefs are worked. Of these the "Theta" reef is much the richest, but as this reef is found lying flat on the top of a mountain, containing a limited amount of ore only, and as it has been extensively drawn upon for years, it is being rapidly worked out. With the working out of the "Theta" reef, the Transvaal Mining Estates will have used up its most valuable asset. No doubt for years to come the company will continue to make fair profits from its other reefs, some of which are now well developed, but considering the very large capital—£604,225—the shares appear to be much over-valued.

Lisbon Berlyn.

Lisbon Berlyn, a concession covering several farms in extent, with its main mine working some seven miles distant from Pilgrim's Rest, is one of the celebrated mines of the Transvaal. The celebrity it has attained is more due, however, to the extravagance with which it was inaugurated, and to the eccentricities and the amusing stories told about an early manager, than to the company's profits, which up to the present time aggregate considerably less than *nil*.

When I visited the property, the handsome hand-painted crockery sets, of which earlier visitors even now speak enthusiastically, had vanished, but there were still many silent witnesses of the lavishness and extravagance that the original directors had bestowed on this celebrated mine.

Reduced to its present basis, the company crushes at irregular intervals from a flat lying, highly refractory reef, with an occasional monthly profit of a few hundred pounds. The principal, in fact, almost the entire extraction, is gained from the tailings. The reef, which has not been developed to any great extent, is of fair value, but owing to its refractory nature only a small extraction is possible. On the whole, the mine may, with advantage, be left alone.

Spitzkop and Graskop.

At **Spitzkop** and **Graskop** mining operations are irregularly carried on with poor results. The formations worked are both alluvial wash and reefs, but no deposits of a permanent value have ever been found.

Barrett's Berlyn.

At **Barrett's Berlyn** results from the same sort of deposits have recently been of a fairly regular nature, and several small dividends have been paid. This sort of mine, however, is, at the best, a poor class of investment, and the public may safely be cautioned against investing its money in them.

Poor mines.

The mines in the district which have, apparently, still poorer prospects, are :—Coetzeestroom, Grootfontein, Lionsdale, Lomatie, and Truer River.

Glynn's Lydenburg.

Glynn's Lydenburg is a sound mine, with ore opened out for some years to come. The machinery is worked by water power, and as working costs are therefore low, fairly good profits are returned. The shares stand at £2½, and are too high, at least, on the results up to date, but the mine promises to have a successful career.

There are several exploration companies at work in the Lydenburg district. These own large tracts of land, but as yet none of them have found payable reefs.

Murchison Range.

The **Murchison Range** lies in the unhealthy "low country" in the north-east of the Transvaal. Mining, owing greatly to the deadly fever season which exists during half the year, has languished in the district for years, and the whole Murchison Range is now practically abandoned. To reach this district the Selati Railway was commenced, but, after the earthworks had been completed for about fifty miles, was abandoned in 1895. The prospects of the district do not warrant its completion.

At various times the Selati, the Sutherland Reef, the Gravelotte, the Free State, and other companies have attempted to work the quartz reefs of the district, but always without success. The Murchison Range, however, is not entirely bad. A personal inspection of the district satisfied me that, given a healthy climate, there are numerous small patches which it would pay to erect five-stamp mills to work, and which would yield good profits to small parties of working men. But it will be years before civilisation spreads to the Murchison Range, and in the meantime the deadly malaria prohibits such work being undertaken.

Klein Letaba.

At the Klein Letaba, still further to the north-east, some extremely rich patches were found in 1891-3, and the Birthday, Ellerton, Letaba, and Ella mines were floated to work them. All of these patches gave out suddenly, once more illustrating the particularly treacherous nature of quartz reefs in the Transvaal, and for years all these mines have been shut down.

CHAPTER IV.

THE GOLD MINES OF INDIA.

Introductory.

All the principal gold mines in India are situated in the Kolar district of the native State of Mysore. The boundary line of the Madras Presidency, however, is only a mile or two distant, and, as the gold bearing formation continues in that direction, the most southerly mine of the group is actually situated in Madras. The mines are connected by a small branch section with the Madras-Bangalore line, and can be reached by rail from either Bombay in forty hours, Madras in twelve hours, or Tutecorin in thirty hours. The country surrounding the mines, which lies at an elevation of 2,800 feet above the sea, possesses few features of interest; the blue outlines of mountain ranges are visible in the distance, but the near neighbourhood presents only an undulating, uncultivated tree-dotted expanse, an unpleasant contrast to the luxurious foliage and well-tilled paddy fields of the lower-lying ground of Southern India. The climate is fairly good, although mild forms of fever and ague are common, but Europeans run a considerable risk from the epidemics of cholera and small-pox, which are continually breaking out among the native workmen. I was assured, and can well believe it, that the prejudices connected with the caste system make it almost impossible to combat the filthy and insanitary customs of the natives. As regards the bubonic plague, which seems to be gradually spreading outwards from Bombay, there have, as yet, [Note A] been no cases nearer than Bangalore. Until it is stamped out, however, there is always the fear of an outbreak among the

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Note A.—It will be understood that the period referred to in this Chapter is February, 1898.

thousands of natives employed on the Kolar field, and should that happen it might cause a serious check in the development of the gold field.

Number of mines and stamps.

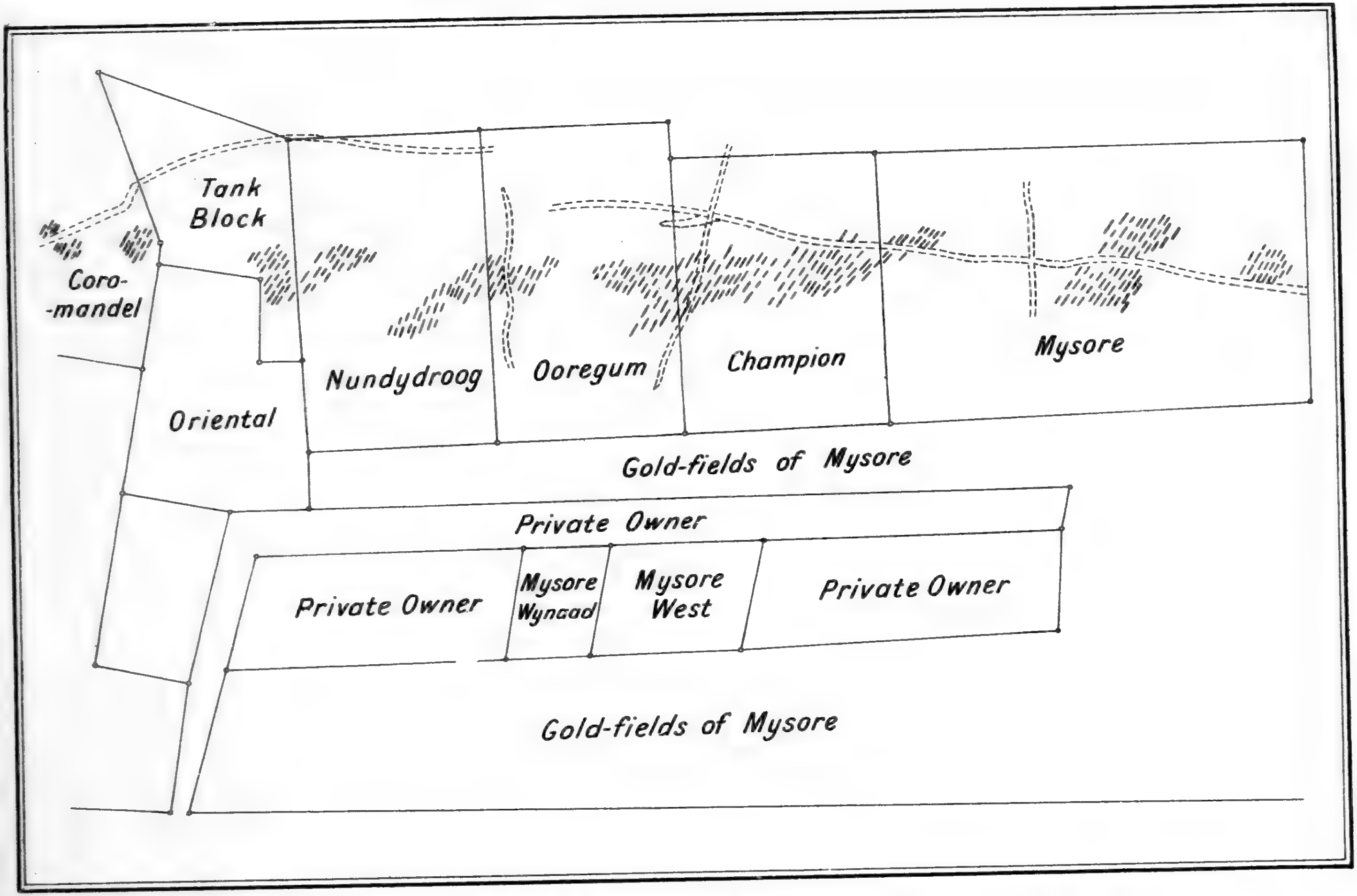
To complete a general description of the field, it may be stated that there are sixteen mining companies in existence, and there are at present [Note A] 525 stamps at work. The central three or four miles of reef presents almost as crowded and busy a scene as a like section of the main reef near Johannesburg, although the substantial stone chimneys and red tiled roofs afford a distinct contrast to the smoke stacks and everlasting galvanised iron of South Africa.

Geological.

As regards the geology of the field, the formation in which the reefs are found is a bed of schistose rock, which is about fifteen miles long. In the centre, this bed is from three to four miles broad, but towards each end it tapers down to a much narrower width, and finally disappears. This bed of schist is surrounded by granite, so that the entire area of the field can be easily determined. A curious feature of this schist bed is that at one side it dips east, at the other side west, while in the middle it lies vertically. This phenomenon has given rise to all sorts of geological theories. It is, I think, quite certain that the main or "Champion" lode is a fissure vein. Although in places considerably cut up by dykes and faults, it holds its course in depth with great regularity, and throughout probably averages four feet in width, with a dip of from forty-five to sixty degrees. To the north and south extremities of the field the lode splits up into several sections, and these, although carrying gold, are decidedly treacherous and irregular. Then, again, there is a series of reefs 3,000 feet to the west, known as the West Reefs. Several of these are worked by different companies, but although the reefs are well-defined and regular bodies, they have not yet been found payable over any large area.

Summary of different reefs.

To summarise the reefs, there are :—Firstly, the main lode on which the richest mines are situated; secondly, the branch



CENTRAL SECTION OF KOLAR FIELD, SHOWING CHUTES OF RICH ORE.

sections of the main lode, which in places are rich, but not so regular in gold contents; and, thirdly, the West Reefs, which so far have not been found payable.

Ore chutes.

The payable gold invariably occurs in chutes. For example, you may drive for 300 feet on a well-defined reef that only carries 1 dwt. of gold to the ton; the next assay will give 1 oz. to the ton, and without any visible change in the nature of the reef, you will find yourself in rich chute ore. This may continue for 100, 200, or 500 feet, when the gold will give out as suddenly as it came in. These chutes can generally be relied on to continue in depth, but instead of going straight down, they almost invariably dip rapidly to the north. The consequence of this is, that a chute of ore discovered near the north boundary of a mine is of comparatively little value to it, because at a depth of a few hundred feet it will probably have dipped entirely into the next property. Although the chutes may generally be expected to continue in depth, this is not invariably the case. Some valuable chutes, which have been worked for years, have recently, to all appearance, given out. On the other hand, some of the deepest workings on the fields indicate that several of the chutes are increasing in width, if not also in richness. I am inclined to think that, on the central section of the lode at least, the chutes will continue in depth, or, should they give out, that others will be found of equal value to take their place.

Ancient workings.

The commencement of modern mining in the Kolar district, which dates from about 1880, was due to the discovery of numerous ancient workings, many of which can still be inspected. The ancients prospected about on the surface till they came upon the commencement of a chute of rich ore. This they would work out, with the rude appliances of the day, actually to a depth of 150 or 200 feet. The method employed was evidently to heat the ore by means of a fire, and then to throw cold water upon it. After this it was rendered more friable, and could be worn away by being hammered with pieces of a harder rock. More mysterious than this must have been the methods used for getting rid of the big flow of water that would be encountered in depth, and especially for keeping the water away from the fires. Large gangs of workmen must have been employed to continually bale and pass up vessels of water to the surface. As if to bear out this assumption, I was shown an old working in the Coromandel mine, in which, the superintendent assured me, were the remains of hundreds of old vessels for carrying water, while series of niches, evidently to hold the feet of the workmen who were baling and passing up the water, were cut in the footwalls. We were standing in a drive 200 feet below the surface, and close by, the blasting had exposed a section of an old stope, the deepest part of the ancient workings on that particular chute. I would have explored this to see for myself some of the relics referred to, but I found that the breadth of the stope, which had been big enough to enable the ancients to work in and to hammer the quartz to pieces, *was not wide enough to contain my body.*

Management.

The management of the mines on the Kolar fields, nearly all of which are controlled from one centre in London, compares more than favourably with most other English-managed mines. The local superintendents strive to attain regular rather than sensational returns, and at the same time, endeavour to have their mines so opened up that a similar yield for several years ahead may be expected. I was furnished with full letters of introduction to all these mines, and can testify with pleasure that every individual manager gave me the fullest information on all points.

Defects in system of working.

I spent two weeks at Kolar inspecting every mine that was at work, and, although I do not consider that in every case the most approved methods for the cheap extraction of gold are employed, yet I can decidedly affirm that every mine of the Kolar field, whether its future is likely to be successful or not, is at least an honestly conducted, legitimate mining venture. The chief defect in the system of working I found to be a lack of centralisation of machinery and plant. The reason for this is the uncertainty as to the future, which prevailed until a year or two ago, and the gradual manner in which the plant had to be increased to meet the growing requirements of the mines. For example, several of the largest mines possess three mills. Each mine has from three to five hauling shafts and from three to five air compressors, and several stone-crushing stations. Separate boiler plants are required for most of these. The result of this is increased costs in fuel and labour. I do not know that anyone can be blamed for this state of affairs, but, at the same time, I am of opinion that the system of mining in vogue on the Kolar field does not fully estimate the value of surface centralisation. There are notable exceptions to this. At the Nundydroog mine the two batteries formerly in existence were some time ago made into one. The saving on this alone, the superintendent informed me, was 1s. per ton. At the Coromandel, also, and several of the more recently started smaller mines, the equipment may be considered as well centralised.

Another defect to which I wish specially to draw the attention of directors, is the system in which the working costs are made out. The reports issued by the different companies are invariably very full and complete, except as regards the details of the expenditure. In gold-mining accounts a separate statement of working costs should always be given, and the minutest analyses of expenditure worked out to the ton milled, should show the cost of every material and every process employed. I feel certain that until this system is employed the full value of centralisation will not become apparent. With these two exceptions, viz., lack of centralisation of plant, and a system of accounts which does not include analyses of working costs, the general standard of management and of work may be considered good. I would specially instance the survey department; and the engineering department, with all the bigger mines doing their own casting, seems to be invariably well conducted. Below ground, the work done has generally been of a sound nature, and the large reserves of ore in most of the mines constitute a particularly satisfactory feature. A notable change, too, on the very subject of centralisation is taking place. The Mysore Company has just erected a heavy-head 120-stamp mill to take the place of its three old mills, and also one central crusher station, instead of three as formerly. At least four of the bigger mines are sinking new main vertical shafts, to cut the reef at from 900 feet to 2,500 feet. Several of these shafts are already [NOTE A] nearly completed, and as they will in each case take the place of several old shafts, their importance is very considerable. These improvements will most certainly effect reductions in costs, but unless a system of analyses of working costs is adopted, shareholders will not realise the importance of the reduction, and their value, as criteria for still further improvements, will be lost to both directors and superintendents.

Working costs

For reasons already stated, it is a matter of difficulty to arrive at an accurate statement of the actual working costs of the Indian mines. They may roughly be said to range between 30s. and 40s. per ton of 2,240 lbs. White labour is not a particularly costly item, as many of the white miners are Italians who go to India on contract at £6 or £8 per month. Black labour, at the first glance, seems to be exceedingly cheap. The average native receives from 5d. to 8d. per day, and natives at about this rate of wage are employed to work rock drills, to blast, to drive engines, and generally to do all sorts of work that in other gold-mining countries could only be entrusted to white men. All stoping is let by the fathom to native contractors, so that the responsibility for a regular labour supply falls largely on the contractor and not on the company. There is, however, no scarcity of native labour. With all this, native underground labour is not cheap. The rock drill men rarely show any ability to save dynamite; the ordinary hammer or stope native does not get through half the work of a Rand Kaffir; while one and all need the closest supervision or they would do no work at all. Timber has to be used in quantities in all the mines, and is an expensive item. It is brought from Calicut on the west coast, some of it, especially the teak wood, being amongst the hardest

Labour.

Timber.

Coal. Dynamite. Water. Cyanide. Shaft sinking.

of all timber. Coal is, relatively, the heaviest item, and its cost probably ranges from 7s. to 11s. per ton of ore milled. Bengal, Australian, and English coal is used, costing from about 24s. to 35s. per ton delivered, but the relative value of each description does not seem to have been yet decided. Dynamite, owing to the great hardness of the rock, and to the want of skill of the native workman, is a moderately heavy item. All the mines are supplied under one contract by Nobel's. The contract price is kept a secret, but the average cost per ton milled, works out at under 3s. The scarcity of the water supply forms a serious question. The Nundydroog mine was recently flooded 300 feet under water, but several of the larger mines, notably the Mysore and Champion Reef, have at times barely enough water to keep their stamps at work. The Champion Company's payment for water works out at 7d. per ton milled. Cyanide treatment is very cheap. Tailings can be screened, filled into tanks, and emptied for 4d. per ton. Little cyanide, too, is required. The extractions I assume to be fairly good, but no figures are kept. The Mysore Company has erected a large plant to treat slimes and residues, which are said to assay only 2 dwts., and it is claimed that a profit will be made on this. To secure good cyanide extractions, it is necessary to use a screen in the battery of at least 1,200 mesh. This fact has only been thoroughly demonstrated recently. Shaft sinking is carried on at the rate of twenty to twenty-five feet per month. The excuses offered for this low standard of work are hardness of rock and climatic effect upon the white miner, but there is room for very considerable improvement. The estimate by the Nundydroog Company for a shaft 1,000 feet deep, timbered, and fully equipped with hauling, pumping, and rock drilling machinery is Rs.326 per foot (£21 15s.). The following table, drawn from recent yearly reports of the five principal mines, gives a rough idea of the costs of different materials and of labour, but owing to the lack of details in the accounts, it can only be a crude summary, and, therefore, not strictly accurate.

STATEMENT SHOWING THE YIELD AND TOTAL WORKING COSTS PER TON OF 2240 LBS., EXCLUSIVE OF ROYALTY AND EXPENDITURE ON CAPITAL ACCOUNT, BUT INCLUDING EXCESS DEVELOPMENT, OF THE PRINCIPAL INDIAN MINES FOR 1896-97.

	NAME OF MINE.					Average.
	Mysore.	Champion.	Ooregum.	Nundydroog.	Coromandel.	
Tons treated	64,297	87,772	63,888	39,490	15,226	
Yield per ton	132/4	102/3	77/0	85/1	60/7	98/6
ITEMS OF EXPENDITURE:—						
Fuel	11/6	6/10	11/3	9/1	7/6	9/3
Dynamite	2/9	2/9	3/0	2/1	2/3	2/7
Timber	1/8			-/8		
Native labour...	10/1			10/10		10/5
White labour...	3/2			1/10		2/6
Water	-/2	-/7				
Transport of gold	1/3	1/3		-/9	-/7	-/10
Administration and general	4/4	1/8		4/8	3/6	3/6
Unspecified	6/10	24/4	26/9	3/8	15/6	
Total per mine	41/9	37/1	41/-	33/7	29/4	36/6

NOTE.—The two smallest mines, Nundydroog and Coromandel, with an average of forty-five stamps each, because they possess centralised surface plant, work at an average of 31s. 6d. per ton, while the three larger mines, with an average of 113 stamps each, but with three mills, three crusher stations, and three tailings plants, and generally uncentralised surface plants, work at an average of 39s. 11d. each

Since 1897, the Mysore has materially reduced its costs, while the Champion and Ooregum may be expected to make a gradual reduction.

Legislation.

We now come to the discussion of an important subject, that is to say, the legislation of the Governments of India, and of the tributary States, as affecting the gold-mining industry. The mines of the Kolar field, lying as they do in the native State of Mysore, come under the government of that State. The ground on which the mines are now situated is part of the area of a concession granted by the Mysore Government to certain parties about 1881. The royalty to the Mysore Government from this concession was fixed at 5 per cent. of the gross yield, and the period of the concession for thirty years; it will, therefore, be seen that the leases of all the mines on the Kolar field have only twelve years to run. In 1897, the royalty paid to the Government from the Kolar mines was £75,000, besides large indirect receipts from railways and from the various subsidiary industries which the gold industry has brought into existence. It appears, however, that the Mysore Government, which is controlled for the young Maharajah by the Dewan, or Prime Minister, a very able Brahmin, is not satisfied with the revenue derived from the gold fields, especially the proportion from such exceedingly rich mines as the Mysore and Champion, and wishes to raise the scale of taxation. Nothing, of course, can be done to increase the taxes from mines already in existence until the present leases run out in twelve years, but it has been notified by the *Government Gazette*, and publicly referred to by the Dewan, that one year before the expiration of the present leases, but not before that, the leases will be renewed for a further thirty years. The terms to be imposed by the Government for the new leases are to be 5 per cent. of gross yield as before, and a per-centage of profits in addition—but the Government has no intention, at present, of stating what this per-centage is to be. In the course of a conversation with the administrative head of the Mysore Government Mining Department, I asked him the following questions:—"If your Government has decided that the mining leases are to be renewed, which is a fact, why cannot the different companies be allowed to take out these renewed leases in advance for the satisfaction of their shareholders? And,

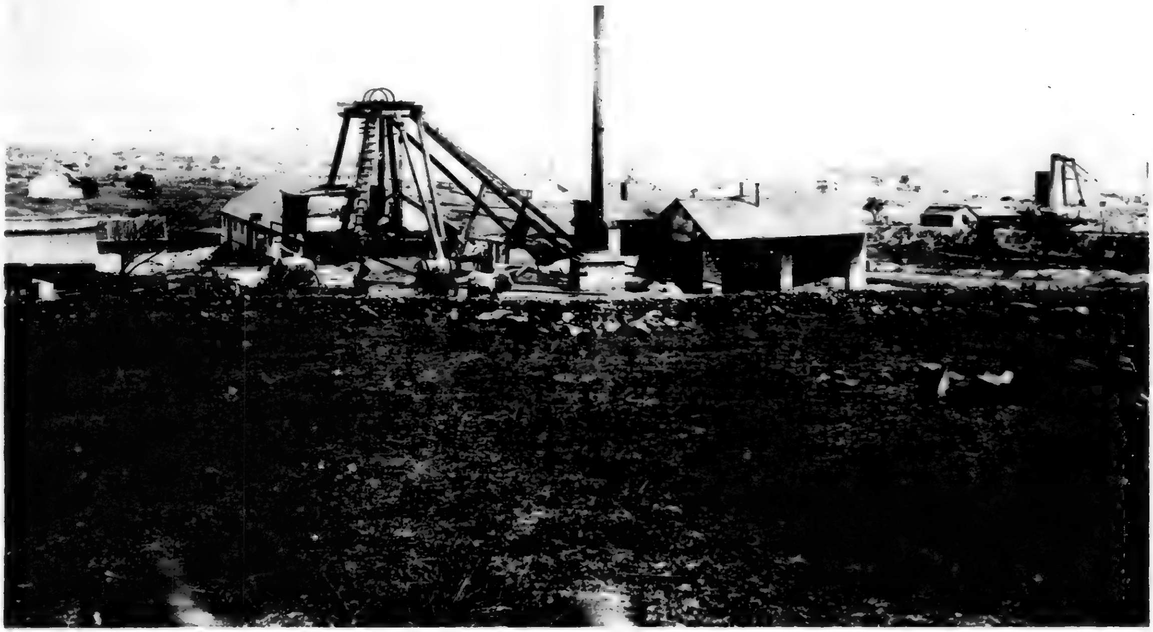
Mysore Government Regulations.

secondly, why does Government refuse to state the percentage of profit, over and above the royalty, which the mines will have to pay to Government on the new leases? Is your Government aware that these proceedings may do great harm to the Mysore gold industry?"

To these questions the official could give me no satisfactory answer. I have not finished yet with my statement against the Mysore Government. It has recently published a form of prospecting license. The cost of the license is Rs.500 (£33 6s. 8d.) for a year, and the area to be prospected must be limited to ten square miles. The third clause of this license reads as follows:—"The Government reserve to themselves the power of refusing to grant a prospecting license in respect of any area without assigning a reason, or to impose such special terms as they may in their absolute discretion think desirable. Special terms will generally be imposed where land comprised in the application for a license has been prospected by Government officers and found by them to contain auriferous or other valuable minerals, stones, or rocks, or any old workings, or other indications of their presence." According to this paragraph, it would seem that the finder of a presumably payable gold reef may in effect have to fix its location almost exactly before he can receive a license to prospect the area in which it is situate. Accordingly, any official or person who receives this information can send a Government officer to find the reef also. After the reef has been viewed or prospected by this same Government officer, the Government can, without assigning a reason, refuse to grant the discoverer of the payable reef a license. It is obvious that such a state of things as this leaves the door open for grave abuses.

Paragraph 9 of this same interesting production reads as follows:—"If the license is refused under Rule 3, or if the applicant, within a fortnight of being informed of any special conditions under Rule 3, declines to accept them, the said sum of Rs. 500 will be refunded to him."

This is very thoughtful of the Mysore Government, but who is to decide what the special conditions are to be? A



CHAMPION REEF MINE—NEW SHAFT.

further proclamation states that, should any prospecting lease be, after this, turned into a mining lease, the royalty to Government from the company to be formed is to consist of 5 per cent. of the gross yield of gold, and from the vendor himself, one-tenth of the consideration received on the assignment of the lease, either in cash or shares, as the Government may determine. Finally, and to again exemplify the unbusinesslike methods of the Mysore Mining Department, I turn to a proclamation dated December, 1897, from the *Bangalore Gazette*. The Government is calling for tenders for mining leases in certain special districts. Clause 2 of the notification reads:—"Each application must state what consideration (in addition to the 5 per cent. royalty, and one-tenth of the assignment price) the applicant is prepared to pay to the Government of Mysore. Such additional consideration may be either in the nature of a present or future payment, or of a share of profits." Clause 5:—"The Government reserves to itself the right to reject any application, without assigning a reason." Here, again, we trace the influence of the mysterious personage who is to have the deciding of all these delicate questions and important financial details, and, as Mysore is a native State, there is plenty of room for the suggestion that the post, if occupied by an unscrupulous person, might prove a lucrative one.

Official opposition to mining industry.

My deliberate opinion is that the Mysore Government, as at present constituted, is incapable of dealing with the requirements of the gold-mining industry, and that its recent legislation on the subject tends to retard the progress of the industry. Of the unbusinesslike and unfair reading of some of its regulations readers can judge for themselves. Of course, Mysore being a tributary State, there is an appeal from its legislation to the Government of India; but the Government of India, as also the Government of Madras, seems to have as little knowledge of conducting a mining industry as does the State of Mysore. There is no mining department attached to the Indian Government, and important technical and financial details are left in the hands of civil servants, who, naturally, are quite ignorant of mining. The consequence is that the whole tenor of the legislation of the Indian and Madras Governments tends to smother rather than to foster the gold-mining industry. A royalty of 7½ per cent. of gross yield already exists, and it is said that this will be increased, while recently published regulations are decidedly hostile in tone. The unwisdom of this is easily apparent. The gold-mining industry, while paying royalties, taxes, and customs dues direct to the various Governments, also makes large purchases of Bengal coal, Calicut timber, and Madras produce, while it furnishes the chief revenue of the Madras railways, and employs, at a high rate of wage, many thousands of natives from all over India. Is it much good, then, appealing to the controllers of the Indian Government to bring pressure to bear on the Mysore Government? Presumably, the Indian Government has approved of the Mysore promulgation, and, if that is the case, its incapacity and ignorance are evident.

The present position of the Indian gold-mining industry, from a legislative point of view, may be summed up as follows:—

Legislative matters which affect shareholders.

(1.) There are no mining departments, with proper technical and financial advice, attached to the Governments of India, or to the subsidiary States. Important mining and financial questions, and the whole policy of the matter, are in the hands of laymen, civil servants, or of politicians such as the Dewan of Mysore.

(2.) The tendency of all the Governments, as the result of this, is to place increased royalties and heavy restrictions upon the gold-mining industry, and to stifle further development and progress, instead of realising how much good the industry has done, and is doing, for India. The recent mining regulations of the Mysore Government, which have presumably been sanctioned by the Indian Government, and which affect the whole future of the industry, betray a lack of technical knowledge, an ignorance of business methods, and a one-sided tendency, where financial details have to be settled, which the officials would do well to take note of.

(3.) Shareholders in all the mining companies, the leases of which expire in twelve years, are, according to the intention of the Mysore Government, not to be informed on what terms the leases are to be renewed. At this distant date this cannot be accounted a very serious question—not one to affect the value of the shares—but it serves to illustrate the business methods and queer dealing of the Mysore Government.

Indian mines not on Kolar field.

Before dealing with the different companies of the Kolar field in detail, a brief summary may be given of the other gold mines in India. These are four:—The Wondalli is an offshoot of the Hyderabad Deccan Mining Company. The mine is said to be developing well, and a debenture issue was recently made for the purpose of bringing it to a producing stage.

The Mysore Kadur had, it was stated some time ago, a large quantity of payable ore in sight, but recent reports do not appear to be so favourable.

The Mysore Harnhalli and Mysore Nagar have no payable ore.

Personally, and at the present time, I should strongly advise investors to have nothing to do with any of these four mines.

Summary of Kolar gold mines.

To briefly summarise the mines of the Kolar field, it may be stated that Mysore and Champion Reef may be included among the great gold mines of the world; while Nundydroog, and more especially Ooregum, are sound mining ventures. These four mines adjoin each other in the central section of the field. Beyond this the main, or "Champion" lode branches into several stringers, none of which are of much value, and all the mines working these, as well as the mines working on the west series of reefs, must be considered as extremely speculative. In other words, while Mysore and Champion will bear capitalisation on a 10 per cent. basis, Ooregum and Nundydroog should be bought to yield not less than 15 per cent., and all the remaining mines, which rarely pay dividends, should yield at least 25 per cent. to the investor.

The following summary deals with each mine in detail :--

Balaghat.

Balaghat. This mine has been re-constructed several times, but has, so far, never paid. It is situated on the branch sections of the main lode, and several of these are being developed. There are several chutes of rich ore in the mine, but none of these are of great width. Apparently the richest ore is found on a chute which comes in from the Coromandel mine, and is found in the Tennant's shaft section of the Balaghat, near its southern boundary, at a depth of about 700 feet. The ground here is somewhat broken up, but should the chute live on the other side of the large dyke which exists here, a certain amount of payable ore may be expected. In the main section of the mine, between the Haines and Ogle shafts, a good deal of ore has from time to time been mined. There is a chute here, about 450 feet long, but the ore is of low grade, and is irregular in value. On the whole, at the time of my visit, it was impossible to assume that the mine would become a regular profit earner. The twenty-five stamp mill, until recently, had not worked since 1894. The surface equipment is satisfactory. Balaghat shares can only be looked upon, in the present state of knowledge as to the mine's capacity, as a speculation.

Champion Reef.

Champion Reef.—Located in the central section of the main lode, and developed by various shafts to from 800 to 1,400 feet deep. This mine was floated as an offshoot of the Mysore ; in 1892 crushing commenced, and up to the end of 1898 £815,000 had been paid in dividends.

There is no doubt whatever as to the great value of the ore developed in this mine, and equally as good returns as those now being made are assured for the next five or six years at least. But when a mine is capitalised, as is the Champion Reef, on a basis of 10 per cent., it is necessary to look ahead for more than five or six years, and I will therefore consider the probability of the mine's existence after that period. At the time of my inspection of the mine, nearly all the lowest workings were in rich ore, thus showing the Champion mine to have an unusually large area of ore chutes within its boundaries. Some day, doubtless, following the almost invariable law on this field, these chutes, in dipping to the north, will all pass out of the Champion mine. But when will that happen? Already a rich patch of ore, plainly the continuation of the most northerly chute in the Champion, has passed into the Ooregum. At the extreme south end of the Champion mine, too, in the neighbourhood of the Dalyell and Garland shafts, the ore in depth is gradually becoming poorer. This would seem to indicate that the lowest of this series of chutes has now been passed through. But between these extremities, although it is only partially exposed, there cannot but be an immense area of chute ore, sufficient, I feel sure, to last for many years; and, after a year's consideration of the problem which the Champion mine presents, I cannot think that, on a 10 per cent. basis, the shares are over-valued.

Within the next year or two the company can materially improve its position with regard to working costs. At present these are too high, mainly owing to a lack of surface centralisation. There are three batteries, numerous air compressor and boiler plants, and too many working shafts.

A main vertical shaft is now being sunk. Round this, in course of time, will be erected a new battery, instead of the three now in use, and a central boiler plant and air compressor. From this shaft most of the ore will be hauled, and its completion, and that of the surrounding central plant, will mean a saving of anything up to 5s. per ton. This desirable change should be expedited as much as possible.

The company has large reserves of tailings and slimes, and ore actually blocked out to the extent of 200,000 tons.

Dividends of from 120 to 140 per cent. may be looked for within the next year or two, and, as has been stated already, the shares on their present 10 per cent. basis (calculated on the dividend for 1898)—which would mean a valuation of £5 10s.—must be considered a first-class mining investment.

Coromandel.

Coromandel.—This mine is situated on the branch sections of the main lode, and is, therefore, not in a favourable locality. The estimated value of the two years' ore reserves, blocked out at the time of my visit, has proved to be wrong, and the profits which the mine made for several years have now practically vanished. It is evident that the chutes found on the different branches in the Coromandel, are treacherous in their occurrence, and in depth they appear to have given out. Shareholders must in future see a lot of payable ore in sight in this mine before setting on it the value they did before. There are [NOTE A] twenty stamps at work, and twenty more being erected. It is doubtful, in the present condition of the mine, whether these new stamps will be started. The working costs of the Coromandel compare favourably with any of the other mines, but the shares are not, in my opinion, a good speculation.

Gold Fields of India.

Gold Fields of India.—This company was formed for the purpose of prospecting, and, if proved good, of floating certain blocks of ground situated at the extreme north of the Kolar field—a locality of which little is known.

The Krishnarajpur Block has already been privately floated, but only on the assumption, quite unwarranted I fancy, that the different reefs traversing the ground, which at the surface are worthless, will become payable in depth. The shares of this company, and of the parent company, may be looked upon as entirely speculative.

Gold Fields of Mysore.

Gold Fields of Mysore.—This proprietary company once owned a great deal of valuable ground on the Kolar gold field, but has, from time to time, sold all its best ground, and has distributed the proceeds by way of dividends. It still possesses six thousand acres, mostly unproved, the best portion of which is so situated as to form a very deep level of the Mysore, Champion, Ooregum and Nundydroog mines. The company has spent a good deal of money in developing a section of one of the west series of reefs, known as the Golconda Block. This mine is now 800 feet deep. Crushing goes on regularly with a twenty-stamp mill, but not with payable results, and the reef in the deepest workings shows no improvement. The company, on a recent reconstruction, has the call on a large sum of working capital, most of which will doubtless be spent on prospecting work over the unproved areas. It is much to be doubted, however, whether payable results will ever be attained from the west series of reefs to which the company devotes its principal attention. The Gold Fields of Mysore holds a large number of shares in some of the adjoining mines to which it has sold ground. I understand that these comprise 129,000 Kempinkote; 50,000 Yerrakonda; 11,417 Nine Reefs; and 10,000 Balaghats—plus the further proportion of recently-issued preference shares in these two last companies.

Kempinkote.

Kempinkote.—Originally the property of this company was located at a spot 100 miles distant from Kolar. Here an enormous reef was developed, but was found to be of too low grade to pay. The company then acquired the ground of the Indian Consolidated at Kolar. This, too, proved valueless. At present an option has been secured from the Gold Fields of Mysore over a block of ground adjoining the Mysore mine to the south, but, although a considerable amount of prospecting work has been done on this block, no ore of a payable nature has been discovered.

Recently a chute of ore, about fifty feet long, was found; this will be further developed, but its area is much too small to allow of its being profitably worked.

The shares are entirely speculative.

Mysore.

Mysore.—Situated on the central section of the main lode, this property is of very large area, but, as in the case of the other mines on the field, the rich ore is only found in chutes, which cover a comparatively small extent of the property. The workings on the principal chute of ore extend in depth to 1,900 feet, the deepest point so far reached in any Indian mine. As in the case of the Champion mine there is no doubt as to the results for the next five years. As to what may be expected after that we must take the evidence afforded by the appearance, in depth, of the different chutes.

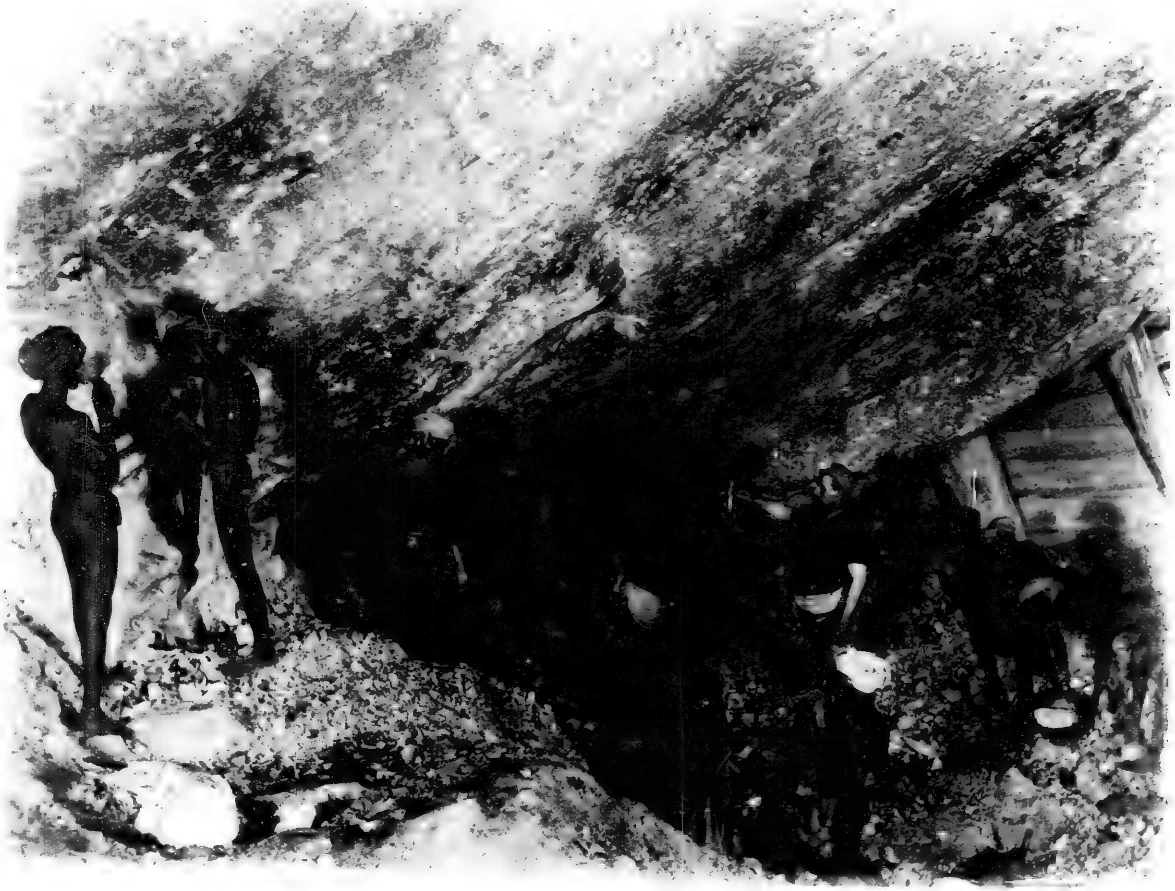
At the north end of the property the chute of ore worked in Gilbert's and Tennant's shafts appears to have dipped into the Ooregum mine, and the bottom of Gilbert's shaft, presumably having passed through the chute, has been in poor ore for some distance.

At the south end of the property the chute of ore worked from McTaggert's shaft, while not of first-rate importance, may be expected to continue fairly good after it has passed from the neighbourhood of the dyke which was lately encountered there. It is, however, on the working of the three chutes in the centre of the property—"Crocker's," "Ribblesdale's," and "Rowse's"—that the future of the mine depends.

Rowse's chute in the deepest workings, 1460 feet, continues to give good ore, and may be considered one of the most valuable assets in the mine.

It is, as yet, an open question as to whether "Crocker's" chute and "Ribblesdale's" chute are one and the same, and on the same reef. A dyke, about 80 feet thick, running obliquely through the mine divides one section from the other. Above the dyke is Crocker's chute, containing undoubtedly the richest ore in the Mysore mine; below the dyke is Ribblesdale's chute, also of great value and extent, but not so rich as Crocker's. In places the reefs either overlap each other, or exist separately, but this point has not yet been satisfactorily settled. Crocker's chute is exceedingly valuable down to the 1620 foot level, the lowest point at which it has, as yet, been cut. There are 100,000 tons of ore blocked out on this chute, and before it shall have finally passed into, or below, the dyke, it may be expected to produce at least as much more.

Ribblesdale's chute has proved of great regularity down to the 1620 foot level. But below this, so far, it has proved disappointing. The 1720 foot level, north from Ribblesdale's shaft, has been driven along the reef for over 400 feet, but at the time of writing [Note A] no payable ore has yet been met with. It appears to me that payable ore should have been found on this



MYSORE MINE—STOPE 1160′ LEVEL.

level 200 feet back in the drive, and the fact is, so far, a distinctly unfavourable point in the otherwise excellent outlook for the future of the mine at a greater depth. The 1820 foot level, north from Ribblesdale's shaft, has not yet reached the area of chute ore, so no deduction can be drawn as to its value at that point.

As before stated, the Mysore mine can easily keep up its present yield for five years to come. As to the future, after that, the two points to be noted are :—

(1.) Will Crocker's chute, the richest in the mine, live below the dyke?

(2.) Will Ribblesdale's chute, which at the 1720 foot level has proved less regular than up above, regain its value at a greater depth?

Shareholders, and would-be investors in this, one of the great gold mines of the world, should keep these two points clearly before them.

There are several points of interest, in connection with the general working of the Mysore mine, to be noted.

A new vertical shaft is being sunk to strike the imaginary continuation of Crocker's and Ribblesdale's chutes at a vertical depth of 2500 feet; this shaft will not reach the reef for some years yet.

A heavy 120-stamp mill of excellent pattern, with a new central crusher station and cyanide plant, has recently been erected in the place of the three old mills, and otherwise decentralised plant previously in existence. A noticeable reduction in costs will be shown, as the result of this, when the next report is issued.

During the next year or two dividends will probably be increased to 140 per cent., but they will only stay at that figure should the two points specially referred to by me turn out favourably for the company.

Mysore shares are a first-class mining investment at £5, and the mine, with continually improving management, promises to have a successful career for a number of years.

Mysore West and Mysore Wynaad.

Mysore West and Mysore Wynaad.— These two companies conjointly work the Tank Block mine, which is situated on a branch section of the main lode. The principal chute worked entered the property from the Nundydroog mine, but, such is the treacherous nature of these branch lodes, that it suddenly ceased to exist last year, and no amount of exploration work has succeeded in developing any more payable reef. The shareholders of the combined companies, refusing to admit that the mine was really worked out, pluckily reconstructed their companies, placing an uncalled liability of several shillings on all the shares, and further explorations are now being carried out. Even should a further chute of ore be met with, there is such a short distance of unworked ground between the present workings and the lower boundary of the property, that the area of any new chute would be but small. As a mine there seems little doubt that the Tank Block is worked out. In addition to the Tank Block mine, the assets held by the companies are as follows:—

By Mysore West, (*a*), one hundred acres on dip of central section of main lode, of prospective value as a deep level. (*b*), Water-rights, leased for £1,250 per annum.

By Mysore Wynaad, (*a*), fifty acres on dip of central section of main lode, of prospective value as a deep level. (*b*), Water-rights, leased for £750 per annum.

These assets appear to me of greater value than the Tank Block mine, but in any case the shares of both companies appear to be over-valued.

Mysore Reefs.

Mysore Reefs.—Situated at the extreme south of the Kolar field, about six miles distant from the central section. Two chutes of extremely limited width have been worked down to 750 feet deep, but never with a profit. At the time of my visit to the mine, twenty stamps were at work, but these have since been stopped. Prospecting operations are going on in several parts of the property, which is of considerable extent, but there seems little probability that anything of value will be discovered. The shares are entirely speculative.

Nine Reefs.—The mine worked by this company is situated on the west line of reefs which, to my mind, at once classes it as extremely unreliable. So far, the mine, worked for a number of years, has been reconstructed several times, but has never proved payable. The deepest workings are now down to about 600 feet, but although the reef is a well-defined body, very regular in its occurrence, it shows no sign of improvement.

Nine Reefs.

The shares are entirely speculative.

Nundydroog.—The area belonging to this company is situated where the main lode of the Kolar field splits up into several branches; the southern section of the mine is therefore on the main lode, and the northern section on the branch lodes. It will not astonish readers who have borne in mind my remarks as to the treacherous nature of the branch lodes to learn that the north section of the Nundydroog, known as Kennedy's, is a failure. Good ore existed here at one time, but in depth part of this chute dipped into the Tank Block, and the rest, without apparent reason, died away. All the bottom workings in Kennedy's section are in poor ore, and it is unlikely that this section will again become profitable.

Nundydroog.

The chute lying on the main lode to the north of the Main shaft is really the only chute at present known to exist in Nundydroog which is likely to continue in depth. This is a fine body of ore, as opened on the lowest level, 1240 feet, it is 400 feet long with a reef five feet thick. It is likely to maintain its value in depth.

Last year the Nundydroog main workings became flooded. This entirely prevented the further development of the main chute, and as the total ore reserves in the mine at the time were only about 50,000 tons it was decided to work with only forty out of the seventy stamps which the company possessed. As development has only recently been resumed in the main mine, and as very little payable ore has been opened up in Kennedy's section, the ore reserves must now stand at a very small figure, and it will be a long time, probably, before the mine again crushes with seventy stamps.

The management of the mine is sound, and may be expected to develop the main chute as rapidly as possible; the fact still remains, however, that the Nundydroog mine, as to quantity of ore, has not turned out so well as was expected; the mine as now known, cannot support seventy stamps, and future profits will be smaller accordingly.

The shares at 3½ appear to stand at more than their intrinsic value.

Ooregum.

Ooregum.—This mine is situated between Nundydroog and Champion Reef, on the central section of the main lode, and has paid to date dividends of about £750,000.

The position of the company can be accurately summarised. Originally several chutes, embracing a large area, were worked. These chutes mostly gave out at a depth of about 800 feet, and although a lot of development has been done below this, at from 1100 to 1600 feet, only one chute appeared to continue in depth. This is a chute of ore in the southern end of the mine, adjoining the Champion Reef boundary. At the time of my visit this chute appeared to be going down almost vertically, and the prospects for the mine, with 110 stamps to be kept employed, were distinctly poor. Immediately after that a remarkable change took place. At the 1410 foot level chute ore was found extending to beyond Taylor's shaft—a distance of 600 feet from the boundary, instead of 300 feet on the level above, and this ore gives every appearance of extending even further into Ooregum ground with each succeeding level. Indeed it now seems almost assured that, following the invariable northerly dip of all chutes on the Kolar field, the immense chute areas found in the Champion mine will eventually all dip into Ooregum. Already 600 feet of really high grade ore is visible in the lower workings of Ooregum, and this, mixed with the 60,000 tons of lower grade ore in reserve in the upper levels, will probably result in an increasing output during every month of 1899. The prospects for Ooregum could hardly be more favourable. Ooregum shares are, to my mind, quite the best purchase among the Indian mines. The mine gives every

VIEW FROM NUNDYDROOG MINE.

promise of becoming in a year or two almost as good as the Champion Reef, and in the meantime, it is capitalised at (January, 1899) £1,000,000, as against a valuation of £2,200,000 for Champion.

The capital is £265,000 in 145,000 ordinary £1 shares, and 120,000 10 °/° Preference £1 shares. These latter, some of which are not fully paid, are entitled to a 10 per cent. dividend, after which all further profits are divided between both classes of shares, and are, therefore, worth £1 per share more than the ordinary shares. In either case both classes of Ooregum stock form an excellent speculative investment.

Oriental.

Oriental.—This is the deep level of the Tank Block, and eighteen months ago, before the collapse of the value of the ore took place in that mine, might have been described as a promising speculative venture. Now that the treacherous nature of the branch lodes, on one of which the Tank Block workings are situated, is better known, and the deepest workings in that mine show so poorly, the outlook for the Oriental is considerably altered. In addition to this, the shaft has now cut the reef at a depth of 800 feet, and the assay results of the reef, now driven on for some little distance, are disappointing.

The company has exhausted its working capital, and the shares can only be looked upon as entirely speculative.

Road Block.

Road Block.—This mine, floated several years ago, is situated on the west line of reefs, and, in my opinion, it is therefore unlikely to become profitable. One cannot, however, in the support of any theory, reason away facts, and I feel bound to state that since the date of my visit developments in the mine have been of a distinctly good character.

The mine is soundly equipped, and two good incline shafts are being sunk on the reef, 1000 feet apart. No. 1 shaft, within 500 feet of the Nine Reefs boundary, has reached a depth of 300 feet, and levels are being driven; up to the date of writing this (February, 1899) several individual assays have yielded 12 and

13 dwts., but taking the average, the ore developed in this shaft is not payable.

No. 2 shaft has been sunk to 300 feet. Along the 200 foot level for a distance of 640 feet the reef has already been proved; it averages from four to five feet thick, and 22 dwts. value for the whole of this distance. At the 300 foot level a cross-cut has been put into the lode which, where cut, is five feet thick, and 30 dwts. value. The development at No. 2 shaft is, therefore, of an exceedingly favourable character. The chute now being developed may be found to be lying flat, and may be of no great depth, but already it is known to be 640 feet long, and probably 200 feet deep, and despite the fact that it is the only payable chute yet discovered on the west line of reefs, the developments already in sight place a speculative value of at least par on Road Block shares. Further developments in this mine should be carefully noted.

Yerrakonda.

Yerrakonda.—This mine adjoins the Mysore Reefs at the extreme southern end of the Kolar field.

When first floated a small patch of payable ore was found and worked out. After that, although the mine was developed to 200 feet deep, nothing of further value was discovered.

The mine is now shut down and full of water.

The shares are entirely speculative.

Summary of share values.

A summary of the Indian mines leads to the following conclusions:—

Mysore and Champion Reef are among the world's great gold mines, and are each worth £5 10s. per share as sound first-class mining investments.

Ooregum promises, with certainty, to greatly improve its position during the next two years. The shares, preference and ordinary, form the best purchase of any in the Indian market.

Nundydroog shares are probably dear enough at £3.

Road Blocks are an excellent speculation at par.

The rest are, to my mind, purely speculative.

TABLE OF GOLD MINES ON THE KOLAR FIELD.

NAME.	Issued Shares.	Par Value of Shares.	Depth of Deepest Workings.	Stamps Working.	Dividends paid to the end of 1898.
		£ s.	Feet.		£
Balaghat	160,225	1 0	800	25	—
" 10 % Pref. ...	63,250				
Champion Reef	440,000	0 10	1500	150	727,500
Coromandel	135,000	1 0	950	20	24,750
Gold Fields of India ...	75,000	1 0	100	—	—
Gold Fields of Mysore ...	275,000	1 0	850	20	—
Kempinkote	748,495	0 5	300	—	—
Mysore	500,000	0 10	1900	120	1,539,905*
Mysore Reefs	159,930	1 0	750	—	—
" " 10 % Pref.	34,980				
Mysore West	130,000	1 0	800	20	—
Mysore Wynaad	130,000	1 0			
Nine Reefs	349,463	0 5	700	20	—
" " 20 % Pref. ...	100,000				
Nundydroog	242,000	1 0	1240	40	421,274
Ooregum	145,000	1 0	1800	110	720,106
" 10 % Pref. ...	120,000				
Oriental	116,358	1 0	800	—	—
Road Block	150,000	1 0	300	—	—
Yerrakonda	187,370	0 4	200	—	—
Totals ...	—	—	—	525	£3,433,535

* NOTE.—The Mysore, and Gold Fields of Mysore have also distributed bonuses in the shape of shares in other companies.

CHAPTER V.

THE GOLD MINES OF WEST AUSTRALIA.

Perth.

LANDING from the mail steamer at Albany, a night's railway journey brings you to Perth, the capital of West Australia. Perth, which before the discovery of gold was a small and absolutely unimportant town, is now a handsome city of 40,000 inhabitants. It is finely situated on the Swan River, which here emerges from the dense bush, and which opposite Perth is a mile broad. The river pursues a tortuous course to the sea, twelve miles distant. At the mouth of the Swan River is situated

Fremantle.

Fremantle, the chief port of the colony, which is connected with Perth by a double line of railway, over which express trains pass every hour or so. Fremantle has about 10,000 inhabitants. It is a busy port, but as yet, with the exception of the monthly steamers of the North German Lloyd, which anchor outside the harbour, no big boats have called at Fremantle. The reasons are that most of the harbour is unprotected from certain winds, while the inner harbour is hardly large enough as yet to allow of big steamers turning round in it. The Government is spending a large amount of money, however, on the harbour, and on breakwaters, so that before long it will be very much improved, but it will probably be some years yet before the P. & O., Orient, and Messageries boats decide to call at

An overland railway to the Eastern colonies.

Fremantle instead of at Albany. In course of time, especially if the different Australian colonies decide to federate, Fremantle may become the Brindisi of Australia; passengers will then be able to travel by rail from here straight to Adelaide, Sydney, Melbourne, and Brisbane, while the mails to Victoria and New South Wales will be expedited by three or four days. While on

NOTE.—The West Australian Mines were visited in April and May, 1898.

West Australian railways.

the subject of railways, it may be stated that the railway system of West Australia is already very complete and well-worked. From Perth there is, firstly, the south-east line to Albany, 340 miles long; this belonged to a private company, but was recently taken over by the Government, together with certain land grants which accompany the original concession, for £1,100,000. Secondly, there is a line due south to the agricultural districts, of which Bunbury is the principal town, together with several branch lines, mainly for tapping the timber forests, which will aggregate several hundred miles. Thirdly, there is a private line from Perth north to Geraldton, 277 miles long, from which Government branches run to Northampton, about fifty miles, and to Cue, the headquarters of the Murchison Gold Fields, 300 miles, or nearly 600 miles in all from Perth. Fourthly, there is the eastern line to Coolgardie, 360 miles; to Kalgoorlie, twenty miles further on; then to Menzies, the present terminus, 400 miles north-east of Perth. Altogether, there must be nearly 1,500 miles of railways in West Australia, and, although the whole population of the colony is only 170,000, it is satisfactory to know that these railways are earning a big interest—something like 10 per cent.—on the capital expended on them. From Coolgardie to the South Australian border is 500 miles. If Fremantle can be made a safe harbour for the mail boats, so that passengers and mails for the whole of Australasia could be landed there, it would be an easy matter for the West Australian Government to continue the railway to the border to meet the South Australian Railway which the Government of that colony would doubtless extend from its present terminus. Connection with the Eastern colonies would then be complete, and the railway, which would save passengers the usually rough sea journey round the coast, and would expedite mails so considerably, might surely be expected to pay. Again, the population of the West Australian gold fields gets nearly all its food supplies from the Eastern colonies; living is consequently expensive, and as the gold fields population has brought prosperity to the country, it is only fair that its interests should be considered when such a scheme as

Reasons for railway extension eastward.

this, which brings the gold fields in direct communication with the Eastern colonies, comes up for consideration, as it most certainly will. So much for the railways of West Australia. I must now proceed to deal with the gold fields themselves.

The gold-mining industry.

I found an extraordinary state of affairs, as regards the gold-mining industry, existing in West Australia. From the earliest days of the gold discoveries, some six or seven years ago, up to the present, the mining industry of the colony appears to have been in the hands of the most dishonest set of men I have ever heard of.

Excessive dishonesty in the past.

The men who took up the claims originally, the experts who reported on them, the several hundred promoters in London who floated the companies, the managers and agents who subsequently represented them in the colony, were nearly all responsible for an immense amount of lying and dishonesty of every sort, and for the flotation and continued existence of something like 450 mines whose prospects were, and are, less than nothing, and whose existence was from the very commencement entirely unwarranted.

It is not the fault of these people that a few really good mines have been discovered, whose history will help to blot out the terrible stain on the colony's reputation; they look on these good mines with jealous eyes, and only long to saddle each of them with a dozen of the worthless mines for which they are responsible.

Dishonesty in mining as compared with South Africa.

There were never nearly so many worthless flotations in South Africa in the height of the boom, as there were in West Australia; and to-day, while the Transvaal has been largely weeded of its wild cats, that class of mine still flourishes by the hundred in the depths of the West Australian "bush." It is not surprising that the state of corruption, so noticeable from the commencement in the West Australian mining industry, should have spread from the head, that is to say, from the promoters and directors in London, downwards through all classes of the community in the colony.

Government.

The Government should, of course, have been the counteracting influence, but, to my mind, it has failed lamentably in its duty. It appears, from its Premier downwards, to have been entirely lacking, during all the years of dishonest flotation, when something like 450 English and 200 Australian mines were floated in the colony, in a knowledge of facts about the real value of all these mines, and, consequently, of the future of the whole industry. There is no Government Engineer to advise on mining matters, and there is little doubt but that during recent years the policy of the Government has been simply swayed by the most powerful of the gold fields communities, who have forced their interests, irrespective of the colony's real wants, upon the Government. To wit, there is the Coolgardie water scheme, which will certainly be a terrible fiasco, and which will run the already heavily indebted colony into an expense of millions. Of this more anon.

Weak in finance and in mining knowledge.

The Government, too, has been weak in finance. Owing to its lack of knowledge of real facts about the mines, it assumed that hundreds of payable properties existed, and on this ignorant assumption has landed the colony in a heavy debt.

The colony's debt.

According to the Premier, the debt is now £8,947,954, or equal to about £52 per head of the population of 171,000. In addition to this the Coolgardie water scheme will entail an expenditure of probably £4,000,000 more before it is completed. When that period arrives the population of the colony will probably be considerably less than it is to-day, and it is quite possible that in the course of a year or two, the debt of the colony will stand at the high figure of £90 per head of the population. It is perhaps not too late for the Government to realise the situation. The Minister of Mines, if he looks the position in the face, will find that it is as follows:—

General outlook for West Australia.

About 450 English and 200 Australian floated mines exist, or have existed, in the colony; the latter are mostly unimportant, and need not be considered. Of the English mines there are ten or twelve which are really good. There are, all over the colony, in addition to these, about thirty more which are justified in carrying on work—a few of which will be successful: nearly all the rest are entirely worthless.

Population will decrease.

As these remaining 400 mines gradually run short of cash, they will be shut down, and then liquidated. Thousands of men will, from time to time, during the next two years, be thrown out of work, and as there is nothing else for them to do locally, they will be compelled to leave the colony. The alluvial fields at Kanowna and elsewhere have been supporting 10,000 or 12,000 diggers for some years. These fields are probably becoming exhausted, and a further large proportion of the population will be idle. At Coolgardie, although there are 150 mines within a few miles of the town, there is hardly one that is really payable, nor will any become payable when and because a water supply is brought in. This town is doomed. At Kalgoorlie there are 100 mines, of which seventy will, before long, shut down. Perth and Fremantle are largely dependent on the gold fields. These towns, Perth especially, are already overcrowded, and will not continue to support the present population. The colony, despite its few good mines, *must* pass through a period of depression, and yet in the face of all these facts, which are quite evident to outsiders, the Government goes on raising loans and refusing to realise the position, quite oblivious of the real state of affairs and, no doubt, intolerant, as is all the rest of the colony, to a criticism of this sort, written merely with the object of showing facts to the outside world. Facts never have been popular in West Australian mining—they do not suit the financial men in London. The financial press, and especially the local press, never criticise mines or mining adversely; and, for a stranger in Coolgardie or Kalgoorlie to refer adversely to the mines is to court extreme unpopularity.

Favourable factors in the outlook.

But there is a backbone of solidity about West Australia and its gold industry after all, and I will briefly sum up the points which must be taken note of as being entirely favourable.

There are ten or twelve good, I may almost say great, mines, already discovered in the colony, and, as before remarked, twenty or thirty which are justifiable ventures, some of which may also be successful.

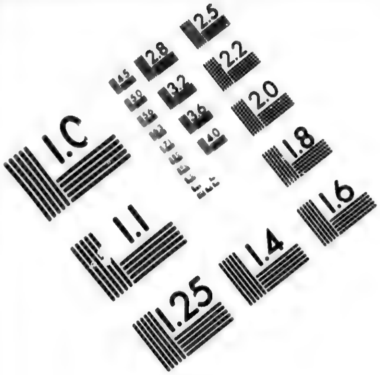
Although nearly all the remaining hundreds of mines are worthless, there is no doubt that, in the immense gold-bearing areas of the colony, intelligent prospecting and exploration work will open up other mines, perhaps many more, which will add to the general value of the industry. This will not be yet, however. The rubbish will first have to be cleared away, and as directors and managers have personal reasons for not relinquishing bad mines, and as foolish shareholders can always be talked into reconstructing a worthless concern, the process will take some years.

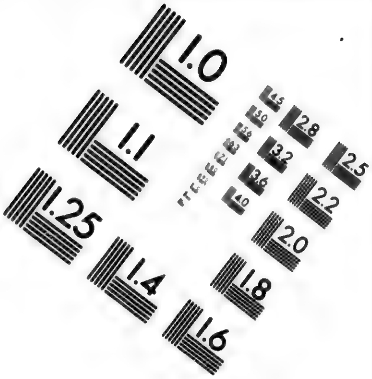
There are in Coolgardie and Kalgoorlie a band, but only a small band, as yet, of honest and capable mining engineers, who, although they have not the control of many of the better mines, provide a backbone of soundness and solidity which is greatly necessary to the welfare of the industry. The better mines are now passing into the hands of a sounder class of manager; some of these men are fairly competent, and some are really good; and, if they have character enough to do the right thing no matter what the directors may tell them, they may be trusted to bring success to their mines, and a certain measure of repute to a district badly in need of it.

Mine management is generally bad.

The whole system of management is wrong. To begin with, the principal power is nearly always vested in an agent of the board, who is known as the legal manager, business manager, or attorney. This personage is rarely an engineer, or even a practical mining man, and does not live on the mine. Under him, and chosen by him, is the mine manager—the really responsible man—who, however, has no control over the policy of the company, and who has to do as he is told. The legal manager, not knowing much about mining, frequently chooses an uneducated man—often a mine foreman from the Eastern colonies—as the mine manager, and the latter has neither the ability to frame a sound policy, nor the power to carry it out, even in the teeth of the legal manager, should such a course be necessary. I could

The system of "legal managers" is injudicious.





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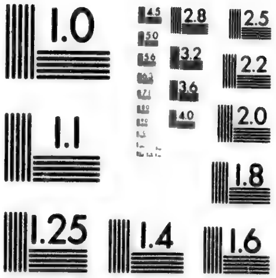

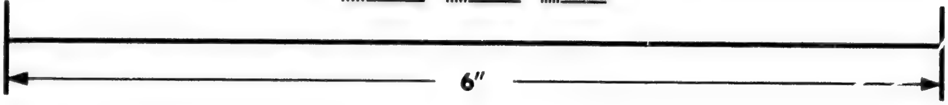

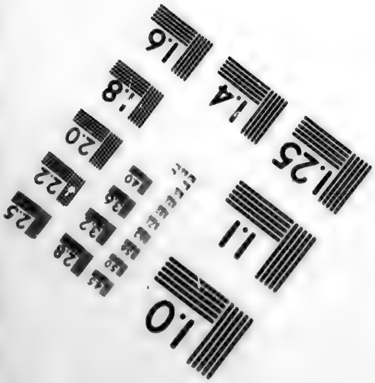

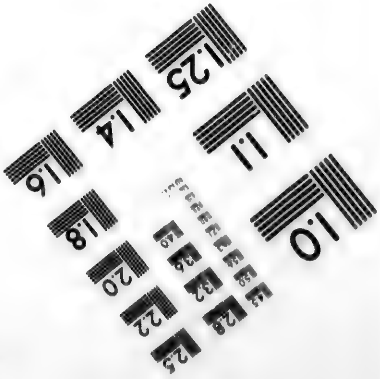

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mention fifty leading mine managers on the Rand who would resign their positions at once if such a state of things existed there. The legal manager, in his own interests, will advise his company to go on working till all its funds are exhausted, while an engineer whose character would be compromised by his continued connection with a worthless mine, would recommend his directors rather to save the cash in hand, and liquidate the company.

Proposed remedies.

There is only one logical remedy for this. Directors must appoint engineers, or general managers, in whom will be vested the supreme control, and who will insist that any mine controlled by them shall be worked on its merits. The salary of such a man would naturally be much more than that paid to the present managers, but if it were divided over several adjoining mines, and most of them are small enough to warrant such a course, it would be less than the combined present salaries of the legal managers and mine managers. Furthermore, it would shortly result in the directors of several hundred wild cat mines being recommended to close down their mines and to distribute the cash that is still unspent. I will refer to those mines which I consider to be well managed when I come to deal with them; in most of these the manager has the sole control.

White miners and democratic principles.

Another reason why a capable, trained, manager is a necessity, is the fact that the miners are an extremely difficult body of men to handle: and there is no doubt that they are pandered to, especially by their fellow-countrymen, to an unjustifiable extent. Australia is, notoriously, the most democratic country in the world, and the working man has nearly everything his own way, in mining no less than in politics. He works eight hours a day for a fixed wage, and in such a manner as seems best to him. If he chooses to insist on a low standard of work in a certain mine, the manager, unless he is a strong man, and certainly if he is an Australian, gives way. The result is, that at many mines which I visited there are 40 per cent. more men on the pay sheet than what the mine could be worked with. At the East Murchison United Mine an American recently took over the management. He found that the costs of working were about 80s. per ton, and that there were, I think it was a hundred, men, on the mine. Finding the ground soft for drilling, he first instituted a system of single-hammer work. The men struck. He replaced most of the necessary posts with Italians. The men then struck work again, and although a number left he found that he could do the same amount of work without them. The mine is now running with costs at about 30s. per ton, and fair profits are being made.

The general want of system in mining matters.

The total want of system in Westralian gold-mining matters, which is one result of the general rottenness, is very noticeable. There is no authoritative Chamber of Mines to insist that the companies belonging to it shall introduce system in their returns and accounts, while if there were such a body most of the companies would probably refuse to belong to it. There is a Chamber of Mines at Coolgardie, and also a Chamber of Mines and a Mine Managers' Union at Kalgoorlie, but these bodies are rendered almost useless by local jealousies. They publish any figures which the mines care to supply them with, and appear generally not to realise what a splendid field of labour is open to them. The returns which the mines make, and their methods of keeping all kinds of accounts and statistics, show the lack of responsibility of the managements, and their intolerance of criticism. Some mines make fortnightly returns of gold: some declare their yield in the middle of the following month: the profit, or the loss, is never stated, nor the value of the gold won. The principal reason for this is that the managers rarely know these figures themselves. No analysis of expenditure can be had for love or money. When managers brag about their working costs, they include the figures of mining and milling only; they forget that there are such items as development of ore, stacking or treatment of tailings, general and head office expenses and depreciation. These items rarely come within the sphere of the managers' calculations. The tonnage of ore treated is generally manipulated to bring the output per ton up to the standard which shareholders in Westralian mines have been taught to expect. Nothing under 1 oz. is permissible, and there are a number of

Rival Chambers of Mines.

Mine returns are useless for reference.

mines yielding, presumably, 1 oz., or 30 dwts. to the ton, which are working at an actual loss. Almost every trial crushing that has taken place in the colony has been of hand-picked ore from the richest, or perhaps the only rich, part of the mine, and this farce is still in active operation everywhere. The recently appointed managers of half-a-dozen companies, men with reputations to lose, informed me privately that the value of the mine was entirely misrepresented to them by the directors, the departing manager, and the press, with the result that instead of finding ounces they have only found dwts.

London control very bad.

The control of West Australian mines, especially of the good mines, seems to be in the hands of an unsatisfactory body of directors. This, however, is usually the case with all mines controlled from London.

Many of the directors, particularly, it appears to me, those with "titles and orders" to their names, are merely the dummies of the large company promoters and market manipulators, but this class of director, densely ignorant of mining as he is, can be trusted to do a great deal of harm to the interests of the shareholders who pay him. The leading company promoters in the West Australian market, cannot surely, on looking back, be greatly satisfied with the results of their handiwork. One group, liquidated last year six or seven of its worthless flotations, and uniting all these under the name of the Standard Exploration, thinks to do great things with the same material under a different guise. Another group, while in the midst of an active career, floating such worthless mines as the Associated Southern, Associated North Western, Associated Auxiliary, Trafalgar, Lake View Extended, and such like, was last year mercifully prevented, owing to a thorough financial crash, from continuing its unworthy course.

The principal capitalists are mere market manipulators.

The principal figures in the West Australian market appear to me to be men who do not care in the slightest for mining, but merely for market manipulation. A large part of the financial press is in their pay; they place dummy directors on most of the boards: shareholders and the public are still, by these means, kept in ignorance of the real state of things in the colony.

Incessant shuffling of scrip of worthless mines.

On the slightest chance new schemes are put forward for absorbing worthless mines: finance and exploration companies are amalgamated, shuffled and again split up into millions of shares, much to the apparent satisfaction of shareholders and the public. All the time no new discoveries are being made. The good mines are passing into the hands of strong shareholders—who will not stand nonsense of this sort; the hundreds of bad mines are gradually running out of cash and approaching their final liquidation; while in London the papers are full of their praises; the issuings of new scrip continue; dummy directors prophesy great profits in the near future, and the great game of humbug goes merrily on.

In describing the West Australian mines I have drawn a very clear line between what is really good or promising, and what is really bad and worthless. There is still an opportunity, in some cases, for shareholders of rubbish to realise their shares: but if they allow themselves to be talked over by the dummy directors, or by the press, they have only themselves to blame.

Mining laws are sound.

The mining laws of the colony, are, on the whole, sound. Ground can be taken up for mining purposes on the payment of £1 per annum per acre, and can be held under these conditions for a period of twenty-one years, with, it is presumed, right of renewal. Any one applying for a lease (Clause 35), "notwithstanding that he may have complied with the regulations in force," may have his application refused without a reason being given. This is somewhat reminiscent of our friend the Dewan of Mysore, and, of course, sets a premium on bribery. Water-rights also can be pegged out for a tax of £1 per annum per acre. No lease can be for more than twenty-four acres, and should a single lease or a series of amalgamated leases, be worked as a company, at least one man must be employed for every six acres held. This is certainly a sound regulation, and prevents capitalists from taking up large areas of country which they do not intend to develop.

Labour conditions.

Exemption from these special labour conditions may be granted if the company can show that it has spent all its money in legitimate development. The question of dual title to mining areas has recently been satisfactorily settled.

A detailed summary of mines and districts.

I will now deal in detail with the various mining districts in the colony.

Coolgardie.

To reach Coolgardie, which lies 360 miles east of Perth, the railway line passes for hundreds of miles, through the waterless bush—a vast forest of stunted gum trees, without a blade of grass anywhere.

This scene, which confronts the traveller the morning after leaving Perth, and which remains continually with him until he again leaves the gold fields far behind, creates a temporary depression so long as it lasts, and leaves in the memory an impression that can never be blotted out.

An Australian poet, describing another part of the desert land of the great continent, has translated this strange scene into vivid language :—

> "A fierce sun glared upon a gaunt land, stricken
> With barrenness and thirst,
> Where nature's pulse with joy of spring would quicken
> No more, a land accurst.
>
> "No faintest sign of distant water glimmered
> The aching eye to bless ;
> The far horizon like a sword's edge shimmered
> Keen, gleaming, pitiless."

The "bush" at night.

At night, in the West Australian bush, a glamour weaves itself over this terrible country. As you drive or ride along the sandy tracks which lead from one water-hole to another, the full moon, shining in a cloudless sky, tinges the gum trees with silver. You hear the tinkling of bells, and presently a long train of camels, the front one led by an Afghan driver, passes silently by, bearing heavy loads to some distant mine.

A cool breeze springs up, obliterating the impression of the heat and dust of the past day, and as you at last lie down to sleep, under the shadow of the silvery trees, the prosaic realities of life in this strange country, with its dishonesty and greed, and its hundreds of terrible failures, are all forgotten.

Round Coolgardie itself, the bush has been cleared away for a mile or two, but all cultivation is, and probably always will be, impossible.

Coolgardie is a handsome town of, probably, 8,000 inhabitants; it is scrupulously clean, and is furnished with electric lights, telephones, and even several hansom cabs. It is the Governmental headquarters of the gold fields, and is the residence of most of the mining engineers, legal managers, local directors, and such like. In the Coolgardie district a great number of mines—151 I counted—had been floated. Most of these were brought into existence on the strength of the wonderful early discoveries at Bayley's Reward and Londonderry—discoveries, by the way, which were confined to areas a few feet in extent, and which have never since been equalled, or even approached.

Coolgardie district flotations.

Hundreds of tracks, several inches thick in dust, radiate from Coolgardie to the mines in the district, but many of these mines are already shut down, and it is only a matter of time before nearly all the rest will be compelled to do likewise.

It is unnecessary to give a list of the 151 mines in this district. I inspected, during my stay, thirteen of the best of these, and from reliable sources, gathered a great deal of information about the remainder. As the result of my inspection, I repeat that I cannot endorse the highly favourable opinions held locally about the majority of these properties.

Total 151, but nearly all are worthless.

It is a fixed tenet of belief in West Australia, which is fostered, too, among English shareholders in these companies, that the Coolgardie mines are, in the aggregate, sound, low grade properties which only require sufficient water for milling purposes to become successful enterprises. It is everywhere stated that when a water supply reaches Coolgardie, dozens of mines will commence to work profitably, and the town and district will greatly benefit. I state emphatically that this theory is entirely wrong, and that it is only circulated as an excuse, by those interested in the town and mines, to delay the final collapse as long as possible. It is hoped, too, that, on the completion of the water scheme, renewed interest will be awakened in Coolgardie

The water scheme is unjustifiable.

mines which will allow many of the largest shareholders to get out.

It will lead to disastrous speculation.

As a matter of fact, nearly every mine ever floated has some rich ore, especially near the surface, and it is quite true that many of the mines at Coolgardie could find payable or even rich ore to keep a mill going for three, six, or even twelve months. Thus, on the completion of the water scheme, all these mines will have their little stores of rich ore picked out and for a month or two will crush with excellent results. That will be a critical period. The financial press will be praising these mines to the skies: the dummy directors in London will be doing all they know to prevent shareholders selling out, and thereby keeping the market clear for their patrons to off-load: the monthly returns for a short period will all be good. Then the final crash will come, and Coolgardie mines will be blotted out for ever.

Now that the Government has sanctioned the Coolgardie water scheme, all these events, in the course of a year or two, will certainly come to pass.

It will cost four millions.

What this scheme will eventually cost the Government it is impossible to say; probably four millions before it is finally completed. There are engineering problems to be tackled in carrying it out, about which nobody can speak with certainty. It may even be abandoned when half completed. But one thing is certain: before the water supply has been established six months in Coolgardie the demand will begin to fall off, and after the first year the thing will be run at a dead loss.

Reasons against water scheme.

The reasons for my strong criticism against this scheme are as follow:—

Firstly: The colony is not in such a financial position as to justify a scheme of this magnitude.

Secondly: The Government has never received technical advice as to the value of the mines in Coolgardie district, but has taken up the scheme solely upon the representations of local politicians, and the public, who, naturally, are interested parties in the matter, and whose opinions are therefore worthless.

LAKE VIEW CONSOLS.

Battery, and Sulphide Plant in course of erection.

Thirdly: A sound knowledge of facts about the gold-mining industry would show the Government that much smaller sums might have been laid out to much better advantage than in this scheme. For instance, the Menzies, Norseman and Broad Arrow districts, which are intrinsically better than, or equally as good as, Coolgardie, should have had public batteries erected, and boring could justifiably have been undertaken in these localities. A public plant for treating sulphide ores could be erected with great advantage at Kalgoorlie, and at Coolgardie itself, some of the more promising mines might have been helped in their development. As a matter of fact, there is water running to waste at Coolgardie to-day, and there is in any case, I think, enough water to allow of the more promising mines crushing on a moderate scale. As to the mines that have absolutely no water, I venture the assertion that they also have no gold, or at least, not more than enough to pay for several months' work, and that when they do find payable gold it will be time enough to agitate for water.

Drawbacks to Coolgardie mines.

To again descend to facts. I summarise the disabilities under which the Coolgardie mines labour under eight heads:—

Narrow chutes.

1. The gold chutes, when found, are narrow in extent, often not aggregating more than 200 feet to a mine.

Low grade ore.

2. The value of the ore, even in the chute, is low grade; picked specimens, and assays prepared for shareholders' meetings, often give high results, but its average value in bulk, even in the chute, is not more than 10 to 18 dwts. The tonnage is often "cooked" to bring the yield out at 1 oz. or 30 dwts., but a reference to the cost sheet will show that the unusually high costs betray the manager's secret.

Hard rock.

3. The country rock is exceedingly hard, and as the chutes dip rapidly, more and more dead work has to be done at each level to reach the payable ore.

Entailing heavy costs to develop ore.

I venture to say that this is one of the most important facts against the value of Coolgardie mines, and is one which is simply ignored by local mining men. West Australian mining never takes notice of such a thing as the cost of development of the ore. All costs are reckoned on mining and milling only. The several hundred feet of driving necessary to reach a "chute" is mentally written off by the manager, and he starts afresh when he reaches the payable ore. He cables to London that the ore on a certain level will yield a profit of £1,000; it is milled and the profit is actually made. This fact he wires to the head office, but quite forgets to state that it cost him £800 in dead work to reach the chute, and that there is only a profit of £200 instead of £1,000. Furthermore, neither he nor the directors realise that the £200 profit, the result of, say, three months' work, is not sufficient to pay interest on the capital sunk in shafts and equipment, let alone enough to pay interest on the heavy nominal capital of the company.

These facts, I repeat, are over and over again flagrantly neglected or slurred over, but were they treated fairly and honestly there is hardly a mine in Coolgardie which can be considered to have ever earned a penny.

Faults.

4. The ground is often severely faulted.

Scarcity of water.

5. There is great scarcity of water over most of the district, although several of the better mines always appear to have enough for their requirements.

Bad machinery and equipment.

6. The equipment of the mines is usually very inferior, and, if anything good were found, would have to be entirely altered.

A poor standard of management.

7. The management is not above the usual West Australian standard—which is poor. In any case the managers have to do what they are told by the local agents, attorneys, or directors, who are mixed up financially with the London cliques, and whose business, therefore, it is not to analyse unpleasant facts or figures, and to play the "water trick" for all it is worth.

Lack of gold.

8. Finally, I venture to state that though there is a scarcity of water at Coolgardie, there is a greater scarcity of

> gold, and while sympathising with the community in the collapse of the district, I think it only right to warn the public against the London clique who will use the water scheme as a means for off-loading mere rubbish, and giving a fresh blow to an industry which, on its inherent merits, is slowly recovering from a great lead of dishonesty of a similar nature.

Coolgardie mines which I inspected.

The mines I inspected in the Coolgardie district are:—

Bayley's United.
Burbank's Birthday.
Burbank's Grand Junction.
Lady Charlotte.
Lady Loch.
Londonderry.
New Australasian.
New Victoria Consols.
Sherlaw's.
Vale of Coolgardie.
Victoria Consols—South.
Westralia and E. Extension.
Bendigo and Coolgardie.

Of these thirteen mines, which apparently form the pick of the district, none have an assured future. Burbank's Birthday is certainly the best, but even here no one can tell what the mine may be doing three years hence. Nearly all of these are too small to form individual mines, and, even as a preliminary to future development, a whole series of amalgamations will have to take place. By these means the short chutes found in several adjoining mines might be worked collectively to keep fifteen or twenty stamps at work, but hardly any single mine in the district, as it is now constituted, owns enough chute ore to run even five stamps continuously.

Amalgamations should be effected.

But how are the amalgamations to come about? It is almost impossible to expect that the directors and managers of these mines, who have probably exalted notions of their value, and who will continue to draw comfortable fees as long as the working capital lasts, will consent to such a course. Later on, perhaps, when these mines go into liquidation, they may be acquired by practical men, who will amalgamate the different companies, and obtain any small profits which it may then be possible to make. But, in any case, as before remarked, the chutes are narrow, hard to get at, and of low grade even then, and, amalgamated or singly, the future for the Coolgardie mines can only be a poor one.

To my mind, the shares in these mines, as well as those in all other mines in the Coolgardie district, are not only not safe investments, but are dangerous speculations.

A series of proposed and specified amalgamations.

A series of amalgamations, which might do some little good, should include the following :—

(*a*.) The mines at Bonnie Vale—*i.e.*, Westralia and East Extension ; Vale of Coolgardie ; New Victoria Consols ; Victoria Consols South. When this took place, twenty stamps might be added to the good forty-stamp mill of the Westralia, and the richest ore of each mine crushed. In course of time, if developments were favourable, the stamps could again be increased. There is, apparently, enough water found locally (the mines lie seven miles from Coolgardie) to serve requirements.

(*b*.) Sherlaw's ; Lady Charlotte ; New Australasian and Flagstaff. All these mines are within a mile of each other ; each mine could probably produce a little payable ore, to begin with at any rate. The present mill at Sherlaw's of, I think, fifteen stamps, now partly idle, could have five stamps added, and the water supply of that mine would probably be sufficient for all requirements. It is not certain that these mines, even if amalgamated and the rich ore picked, would pay, but at least the result would be no worse than at present.

(*c*.) Lady Loch ; Lady Maude ; Lady Hampton ; Lady Emily. These mines are all near each other, and apparently all are equally bad. I do not think they would pay under any possible amalgamation ; the similar nomenclature is my only reason for suggesting such a course.

(*d*.) Bayley's United and King Solomon's Mine.

(*e.*) The various mines of the Burbank's group—except the Burbank's Birthday, which is just big enough to be worked by itself.

Hampton Plains group.

(*f.*) The Hampton Plains group should be re-amalgamated and formed into an exploration company only. There were never gold discoveries at Hampton Plains good enough to warrant the flotations of subsidiary companies as gold mines. The prospects for gold are almost *nil.*

Following this is a short description of the mines I visited in Coolgardie district.

Bayley's United.

Bayley's United.—The reef is of a treacherous nature, and it is frequently cut out altogether, leaving only a black seam to follow. The deepest shaft is down 450 feet. At the 380 foot level there is a stretch of reef of uneven value which has already given out at one end of the drive. In places in the mine rich pockets of visible gold are occasionally encountered, but, except for these, the general average of the reef, taking into account the amount of dead work necessary, is not payable. Good profits are being made from the treatment of old tailings, and are being sunk in the development of the mine. The future is doubtful.

Burbank's Birthday.

Burbank's Birthday.—This is the best mine in the Coolgardie district, the ore chutes apparently extending for 600 or 700 feet. In addition, the mine is fairly well opened out, there being about two years' ore in sight. Against this is the fact that the yield per ton has steadily fallen from 2 ozs. to 27 dwts., and has, apparently, not stopped falling yet. With a well opened-up mine to draw upon, this shows either bad management, or that the ore has been picked, and the yield is now returning to its natural figure, which is probably not more than 1 oz. to the ton. The mine has twenty stamps, and enough water for them, and a tailings plant is now being erected. A dividend may now and then be looked for from this mine, but not, I think, regular results.

Burbank's Grand Junction.

Burbank's Grand Junction.—Still in a very initial stage. Two reefs are being developed; one is very small, with several narrow gold chutes cutting diagonally across it; the other is four feet thick, and of lower grade. Continued development is justified, but it is by no means certain that the mine will ever be a payable one.

Lady Charlotte.

Lady Charlotte.—The 100 foot level is in disturbed country; at the 200 foot level the chute of gold is 300 feet long. It is estimated that there are 15,000 tons of ore developed, worth 15 dwts. This is a low grade result, but if the mine joined an amalgamation scheme of the adjoining companies, its ore might be treated at a profit.

Lady Loch.

Lady Loch.—This is a very doubtful concern. The chute ore is worth only 12 dwts., and there is a very limited amount.

Londonderry.

Londonderry.—There are two rich chutes in the mine, which yield pockets of very rich ore, thickly studded with free gold. These chutes are each only a few feet broad. Between them is about 120 feet of reef, say three feet wide, which will yield 10 dwts. The mine is being carefully developed, and it is thought that with the occasional discovery of a rich pocket, consistent, though small, profits may be earned. There is, however, so much dead work to do to reach the payable ore at each level that this seems doubtful. The mine has ten stamps and a fairly good water supply.

New Australasian.

New Australasian.—This mine had some very rich ore, which it worked out. The reef is now faulted below the 140 foot level, and has not yet been refound.

New Victoria Consols.

New Victoria Consols.—A local company, which has 15,000 tons of ore developed, which is supposed to be payable.

Sherlaw's.

Sherlaw's.—The ore chute is 170 feet long, and the reef two feet thick. To reach this a large amount of dead work, through exceptionally hard ground, is necessary. The mine is running short of development. It has ten stamps at work and a yield of 15 to 18 dwts., but is not, I fancy, making any profit.

Westralia and East Extension.

Westralia and East Extension.—This is a fissure vein of white quartz, about eighteen inches thick, lying between solid walls of granite, at an angle of twenty degrees, and is one of the most curious formations that I have ever seen. A large amount of development has been done, and the mine has now a good forty-stamp battery at work. The yield varies from 12 to 16 dwts., but as the method of mining employed must be a most expensive one, there cannot, at present, be a large profit. With care the mine may be able to make regular, though small, profits.

Vale of Coolgardie.

Vale of Coolgardie.—This mine is being soundly developed and has probably 25,000 tons of ore in sight, worth 15 dwts. The chutes are not of great length, and the mine will not do much good unless amalgamated with adjoining companies.

Hannan's.

Hannan's.—Or Kalgoorlie, as the town is now called; is twenty miles beyond Coolgardie, and connected by a frequent and excellent service of trains. Gold was first discovered here in 1893, and a year later several of the mines began to make returns. These proved to be so rich, that Hannan's before long supplanted Coolgardie, and became the more important centre of the two. Kalgoorlie is now a straggling town, inferior to Coolgardie in most respects, but with a population, including the mines within a radius of four miles, of from 20,000 to 25,000. The town possesses three daily papers, one hotel, at least, which will rank with any in Australia, and a local railway along the reef, with trains running every few minutes. Beyond the actual requirements of the considerable mining population, however, there is no business doing. Speculation is dead. There are probably over a hundred worthless mines situated within four miles of the town, and when these close down, as they inevitably must before long, throwing some thousands of men out of employment, the state of Kalgoorlie will be still worse than at present.

Kalgoorlie.

Hannan's Belt.

The Hannan's Belt, in which formation all the mines are situated, extends for six or seven miles in length, is about a mile-and-a-half wide, and lies, approximately, north and south. This same formation may extend for a much greater distance, but no gold has ever been found outside of the present area, and its secret is still hidden beneath the eternal bush. In this formation, running also north and south, are a number of parallel lodes, which apparently carry gold, although usually in unpayable quantities, throughout their entire length. These lodes, although as yet they have not been continuously traced from mine to mine, nor has any geological survey of the area been made, do not appear to be regular in their occurrence. They seem to run for a certain distance and then either to die out or to branch into other lodes, and so become lost. In places the same lode can be traced with certainty for several thousand feet in length, but on most of them the work done does not prove a length of more than a few hundred feet. As a rule, the lodes, though nearly vertical, dip very slightly to the west, but in places they are found dipping to the east, at least for a level or two. Several of the lodes have already been proved to a depth of 500 and 600 feet, and at that depth their characteristics do not vary from what they were at shallower depths. As to the nature of the lode matter, it is something quite new in the history of gold mining. It seems to be a mixture of talcose schist, diorite, and quartz, heavily mineralised throughout—but in the decomposed ore of the upper levels the schistose matter is more prominent, while the deeper the lode goes the quartz element seems to become more pronounced.

Geological features.

Many unpayable mines at Hannan's.

A section taken across the present exploited width of the Hannan's Belt would reveal possibly fifty distinct gold-bearing lodes, and also the presence of gold, although in small quantities, in enormous stretches of less clearly defined lode matter, so much so, that several competent authorities have assumed that the whole belt may consist of auriferous dyke or lode matter. As before stated, the gold, although spread over so many different lodes, is generally found in unpayable quantities. Many of the mines which have been floated on the Hannan's Belt have not yet been found to contain a single ton of payable ore. A still larger number, after years of development, have been found to contain minute patches which would pay to work, but for all practical purposes they are in an equally hopeless position; there are about a dozen mines thought by local people to be highly promising, but which, in reality, are hovering on the verge between eventual failure or working without a loss; and, finally, there are eight proved good mines, of which several promise to be among the greatest gold mines the world has known. Of these eight good mines seven adjoin each other, and are situated within an area of about a square mile. There is no known reason why the parallel reefs as they pass through this particular section of the belt should contain rich patches of considerable length, and, as a matter of fact, these rich patches are confined to only a few of the lodes; but the fact remains that this square mile, among the mass of worthless concerns in West Australia, is a genuinely rich mining area, *and probably contains more gold than any other area of equal size yet discovered in the world.* The names of the eight good mines are:—Associated (Australia leases), Kalgurli, Great Boulder, Great Boulder Perseverance, Lake View, Golden Horseshoe, and Ivanhoe, within the rich area, and Hannan's Brownhill at a distance of a mile away. These mines vary in degree, but they are all good mines.

Eight good mines.

The richest square mile in the world.

A group of speculative mines.

After these, as I have already stated, there is a very big gap, and I do not consider that any other mines on Hannan's Belt have yet been proved payable. From this small group of rich mines, stretching out for miles in all directions, are the headgears of the shafts of, probably, a hundred mines, floated on the success of the few good ones, but although absolutely worthless many are still at work, spending their remaining capital in fruitless developments. Closely adjoining the mines of the rich area, indeed, almost lying within the area, are a number of mines—about a dozen—which are those commonly supposed to be also good, and whose shares stand at high prices. After personal inspection of most of these mines, I am decidedly of opinion that none of them are yet proved payable, although some may become so in time, and a great gap separates the best of these from the poorest of the eight good mines.

Future mining conditions at Kalgoorlie.

Even with only eight good mines a great future is assured for the Kalgoorlie field, and although the next year or two will witness the closing down of a hundred worthless mines, the throwing out of employment of thousands of men, and the probable further stagnation of business in the district, yet a large output of gold is assured from these few certain producers, and big dividends will be earned by them. As to local conditions, water is found in sufficient quantities for present requirements, and, although salt, can be used for mining and milling processes. There is not likely to be a scarcity for some years to come. Until the oxidised ore is worked out, the ordinary stamp battery, or dry crushing with ball mills, and cyanide treatment, is all that is necessary. Fuel, with hundreds of miles of "bush" to be cleared away, is plentiful, and as the larger mines have their own railway sidings, it can be landed at no great cost. The climate, at least in winter, is perfection, and efficient labour is always procurable. The great problem, however, which the Kalgoorlie mines have to face is the treatment of the unoxidised, or sulphide, ore, which is found at a depth of about 120 feet, and which is complicated by the presence, in places, of large quantities of telluride.

Free milling ore.

Free milling ore is found in all the mines. In some it lasts down only for a few feet, in others it is still free milling at 250 feet deep. This ore is friable, and can be easily and cheaply treated, either by stamps or Huntingdon mills, by the wet process, or by rock-breakers and ball mills, by the dry process. It is, therefore, an advantage to a mine at Kalgoorlie to possess a large amount of free milling ore, and is a distinct point in favour of the near future of such mines as possess it. The most fortunate mines in this respect are the Hannan's Brownhill, which, so far, has only got free milling ore, the

Ivanhoe, and Golden Horseshoe. The two mines which have, comparatively speaking, the least free milling ore, are those two splendid mines on the Australia hill, Associated and Kalgurli, while the Great Boulder, Lake View, and Great Boulder Perseverance, are also rather rapidly coming to the end of their reserves in this respect. Below the free milling region, the ore is "unoxidised" or "sulphide," and in addition to this is complicated by the presence of telluride. This sulphide ore seems, on the whole, to be richer than the free milling ore, but it is distinctly more expensive to treat. Firstly, it contains little or no free gold, so that it is useless to treat it by the wet process either by stamps or Huntingdon mills, because no gold would be caught by the mercury. Secondly, the ore must be roasted, to liberate the chemical compounds, or even the cyanide solution would fail to dissolve the major portion. This necessitates treatment by what is known as dry crushing and roasting, which is infinitely more complicated than stamp crushing, and which is a good deal more expensive into the bargain. To begin with, the wear and tear in dry crushing is very heavy; on Johannesburg sulphide ore, for example, it would hardly leave any margin of profit, but the lode matter of Kalgoorlie is more amenable to the process. Only small tests of the whole treatment have yet been made, but they have been successful, and all the authorities on the field are agreed that, subject to adjustment, the process can be profitably adopted. The whole treatment will be as follows:—The ore will first be put through a rock breaker and graded to the size of one inch; then through a second breaker, which will crush it to half-an-inch; it will then be roasted by passing through a reverberatory furnace; then, having thus been made friable, it will be put under rolls, and its crushing will finally be completed by Krupp ball mills. The dust will be separated mechanically into two products, sands and slimes. The sands will be treated by the ordinary cyanide solutions, and the slimes will be filled into filter presses, through which the cyanide solution will be forced.

Sulphide ore.

Dry crushing and roasting.

Problems of the dry crushing treatment.

Theoretically, this is the whole process, but there are several imperfect features about this treatment which will have to be overcome before it can be accepted as satisfactory. Firstly, no account has been taken of any coarse gold that may be found in the ore. This coarse gold cannot be dissolved by the ordinary cyanide treatment. It will, therefore, probably be necessary to separate the dust from the ball mills into three products instead of two, and this may be found a matter of difficulty. Besides the sand and the slimes there will be a third product containing the heavier sands and coarse gold, and this product will have to be put through an amalgamating pan before being cyanided. Secondly, there is the fear that the rich patches of telluride ore may be over-roasted in the furnace, which would cause the tellurium to be driven off and the remaining gold to fuse into small pellets which would not be amenable to cyanide. Here, again, it will be necessary that a third product, including such small pellets of gold, should be produced and put through an amalgamating pan before being cyanided. Thirdly, there is the filter-press treatment of slimes. This is accepted, in theory, as already an accomplished success, but such, however, is not the case. At the Lake View, the first mine on the field to inaugurate filter presses, the process had just been commenced when I was there. The theoretical extraction was said to be 80-86 per cent., but the actual extraction could not have been anything like so much, as the presses were leaking at a hundred places and were constantly getting broken, while the cost of treatment promised to be considerable. Since this, I understand that most of these difficulties have been overcome, but the process cannot yet be considered as perfected. Finally, there is the question of water. When all the big plants are at work, even though the majority will be using the dry process, there will probably be only a barely sufficient supply of water to go all round; even that will be salt, and in a complicated process such as dry crushing and roasting, it may cause some unpleasant chemical reactions when the cyanide solutions come to be used. We

Coarse gold.

Telluride.

Slimes and filter presses.

Water.

have, therefore, some half-a-dozen problems connected with the refractoriness of the ores and the scarcity of water, any or all of which may cause considerable trouble before they can be adjusted. Looking at the matter squarely, it seems unlikely that any of the problems as they arise will cause present calculations to be greatly overthrown, nor should any of them permanently interfere with the eventual success of the whole treatment in its various processes of crushing, roasting, rolling, milling, mechanical separation into two or three products, and eventual special treatment of each product. The position for shareholders, however, is this:—The dry treatment of sulphide ore is a process quite new to West Australia; managers and engineers, if they have misgivings as to any problem likely to arise, will not inform anyone but the directors—perhaps not even them; the directors, who are notoriously not practical mining men, will not see the importance of such warnings, nor, if they did, would it suit them to publish them and so create an uneasy feeling on the market. In other words, the shareholders will only be informed when the mistakes have been made, and only then will they learn that the unduly optimistic returns which they have been led to expect will have to be again postponed for six months or a year. Eventually, as I have said, matters will right themselves, but in the first two or three big dry-crushing and roasting plants which start there are sure to be disappointments, and shareholders, in the meantime, must not be led away by the statements they hear, and must be prepared for a lower extraction and a higher cost than either the directors or the management calculate on.

These problems will be overcome.

How shareholders must regard these problems.

We may now pass on to a consideration of the mines of Kalgoorlie in detail. Let it be clearly remembered that these must be separated into the three following groups:—

Summary of Kalgoorlie mines.

(*a*.) The eight great mines.

(*b*.) The dozen or so mines which adjoin these: through which the same lodes pass: which might be expected to have rich patches of ore, but which, as a matter of fact, have *not* got rich patches, or at least only to a very limited extent. These are speculative.

(*c*.) The remaining mines—which are rubbish.

It is an extraordinary fact that one section of Hannan's Belt, equal to about two square miles in area, should contain so many reefs, each carrying rich patches, and that all the rest of the Belt should be worthless, but such is the fact. It is noteworthy that in the rich area the lodes lie between distinct walls of diorite, whereas, where the lodes are poor, they are generally surrounded by rock of a slaty nature.

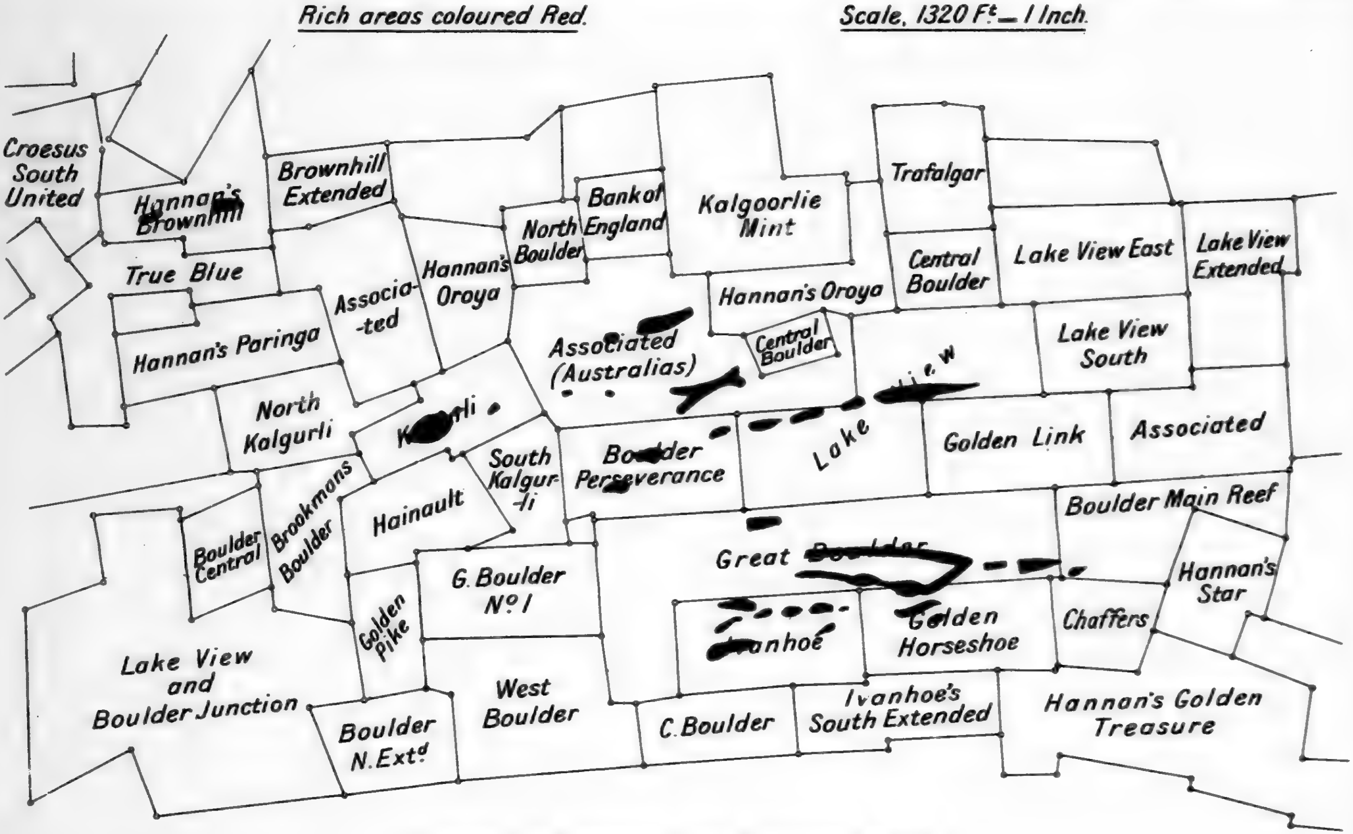
Of the group of mines which surround and lie adjacent to the rich mines, one or two may be considered promising, but none are yet assured successes, and a great gap separates the best of these from the worst of the eight good mines.

The rich mines and investors.

Investors must confine their attention to the eight good mines. Speculators may, at considerable risk, deal in the shares of the second class mines, which will be clearly enumerated; but on no account should anyone touch a share in the worthless rubbish which forms the great bulk of Kalgoorlie mines, and to which the London promoters, helped by the financial press, continually endeavour, in the regulation West Australian manner, to draw the ignorant public.

Special features about the rich mines.

The extraordinary features in connection with the good mines are:—Firstly, the unusual thickness of the reefs, which are rarely less than six feet, and occasionally are found thirty, fifty, or as high as eighty feet thick, carrying payable gold throughout the whole width; and, secondly, the considerable quantity of telluride of gold which is usually found mixed with the lode whenever the sulphide region is reached. Telluride, as found here, is a mineral of silvery appearance, and is composed of gold, silver, and tellurium, in varying quantities; an average analysis would yield, perhaps, 43 per cent. gold, 2 per cent. silver, and 55 per cent. tellurium. Sometimes this mineral is found in great splashes spread over a square foot of ore, but usually in minute specks throughout the rock, giving a bulk assay value of from 2 to 5 ozs. per ton.



Section of Hannan's Belt, Kalgoorlie, W. A.

A SUMMARY OF THE RICH MINES MADE IN 1898.

The following Table, dealing with the good Kalgoorlie Mines, is compiled from a Private Report written by me in May, 1898, and shows what the position was at that date.

NAME.	Issued capital.	Tons of ore in sight.	Probable yield per ton.		Estimated profit to be made on ore & tailings in sight.	Ore in sight for	Probable yearly dividend on ore in sight.
	£		s.	d.	£	Years.	Per Cent.
Great Boulder...	160,000 (1,600,000 2s. shares.)	130,000	120	0	700,000	3	120
Lake View	250,000	320,000	120	0	1,280,000	$3\frac{1}{3}$	130
Kalgurli	110,000	80,000	140	0	400,000	3	120
Ivanhoe	1,000,000 (200,000 £5 shares.)	125,000	120	0	500,000	4	12
Associated	450,000	280,000	100	0	840,000	3	60
Golden Horseshoe	100,000	60,000	160	0	360,000	3	120
Hannan's Brownhill	110,000	160,000	120	0	640,000	3	200
Great Boulder Perseverance... ...	175,000	(I was	not allowed		to inspect	this mine.)	

NOTE.—Since this was written, nearly a year ago, some of the mines have largely increased the quantity of ore in sight, especially Associated, Ivanhoe, Golden Horseshoe, Great Boulder, and Kalgurli. In the above calculation the value of Golden Horseshoe was greatly underestimated, but the estimated value of the remaining mines is probably not wide of the mark. The dividends calculated on can, of course, only be paid when the mines are fully equipped for a large production of both oxidised and sulphide ore.

The first of the great mines to be dealt with, and the biggest mine in West Australia, is the **Associated.**

Associated.

The issued capital of this company is £450,000: its cash position is excellent; and it has already paid two dividends, aggregating £90,000. It owns about eight leases in different parts of the Kalgoorlie Belt. All of these leases, with the exception of the Australia Block, are absolutely worthless, and should be got rid of, as their development acts as a drag upon the resources of the company. The three leases which adjoin each other on the Australia hill, a long low eminence rising above the level of the surrounding country, and measuring 600 yards long by 300 wide, form, together, one of the most remarkable gold discoveries ever made. The whole hill appears to be composed of solid gold-bearing lode matter; at each end of the hill the lodes die out to their normal width, but in the middle, in the heart of the Associated area, the aggregate width is probably 700 feet of lode. The great bulk of this is low grade, worth from 4 to 8 dwts., but interstratified throughout the whole width are seams of ore which are of great width and highly payable. The most easterly of these rich sections which has been opened out is that at No. 6 shaft, which is 60 feet thick: the most westerly is at Tetley's shaft, 20 feet thick, but between these two extremes cross-cuts have penetrated several other valuable sections which, owing to pressure of work elsewhere, have never been developed, but which yield over 1 oz. in value for considerable thicknesses, and which will most certainly be found to be payable.

Great width of reef.

As to the permanence of the Associated lodes in depth, and the continuance of the gold in them, it is now possible to speak with considerable certainty.

Deepest workings show permanence in depth.

At the time of my visit the deepest workings in the mine, those at Tetley's shaft, were 240 feet. Here the ore, and its value, was distinctly good. Since then the same section has been developed to 500 feet deep, and, on the whole, it may be said that the last 250 feet show a better result than the first 250. At No. 6 shaft, too, the then workings at 100 feet have been deepened to 200 feet, showing no falling off in value.

Of course, these rich patches in the Associated, as in the other mines on the field, do not extend laterally for great distances. The nature of the lodes appears to be lenticular (wedge shaped), and every here and there the rich run of reef dies out, and becomes replaced by another stretch which, perhaps, is unpayable. The rich runs of ore at Tetley's shaft aggregate already from 700 to 800 feet; at No. 6 shaft, 400 feet, and in other parts of the mine considerable distances. Taking into account the great width of these reefs, and the very considerable lateral extent of the rich patches already exposed, it may be asserted with perfect safety that there is an immense quantity of payable ore in the mine. The ore is now proved payable to 500 feet, and, though the mine should never possess another ton of good ore below that depth (which, of course, is an absurd supposition), there is, above that level, enough payable ore to permit of a big output for many years to come. So much for the quantity of ore in the mine. As to quality, my opinion is that, for some time to come, the output all round will average 25 dwts., or £5 per ton. This amount could be recovered from an output of, say, 12,000 tons per month, and at a cost of £2 per ton. A safe estimate for the yield and profits of the Associated, when the full plant starts, would, I think, be as follows:—

A long life assured.

12,000 tons per month will yield 15,000 ozs., worth	£60,000
At a cost of £2 per ton	£24,000
Profit	£36,000
Profit per annum	£432,000

Allowing of a dividend of 80 to 90 per cent.

Estimate of profit and dividend.

The management may decide to treat a greater quantity of ore in a month, in which case the yield per ton would be rather less, but the profit would not, I think, be greater. The manager and directors estimate that the yield will be much greater than what I have allowed; indeed, they have placed it at 24,000 ozs. This sensational figure might be attained for a month or two, but not for many months consecutively, and shareholders should not accept these figures, although I believe they are given in good faith. Again, there may be disappointments before the plant is brought into thorough working order.

Oxidised and sulphide ore will be treated when the new plant starts. The oxidised ore treatment is fairly simple. The ore is dried, ground by Krupp ball mills, and the product is cyanided with a fairly good extraction.

Treatment of sulphide ore,

The sulphide ore treatment is, at the time of writing, only in the experimental stage. It is a new process, but experiments on a small scale indicate that it will, in all probability, be successful.

The ore is to be crushed by rock breakers, then semi-roasted; after this it is crushed by rollers and then by Krupp ball mills, and the product will be cyanided. The slimes from each process will be put into filter presses through which cyanide solutions will be forced.

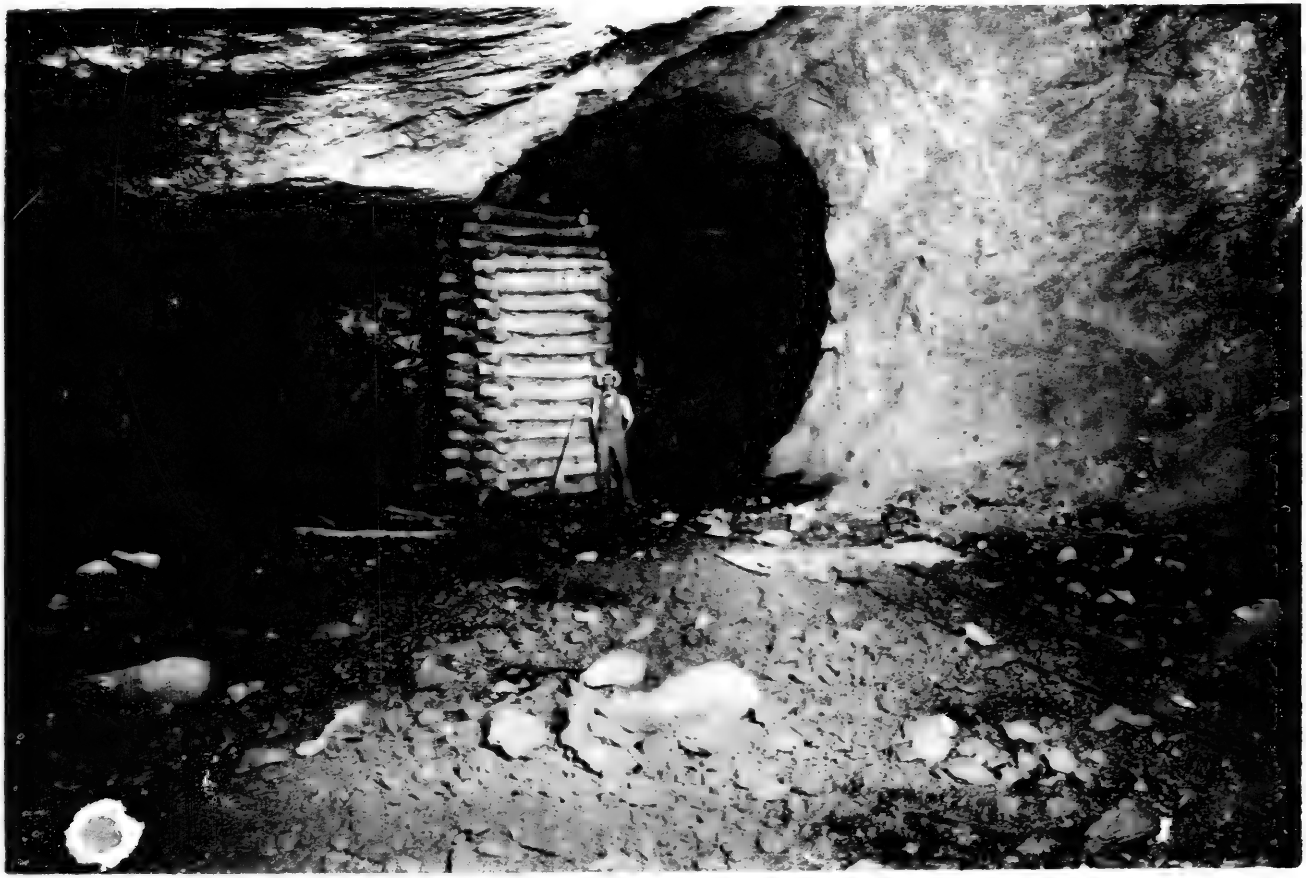
This treatment of sulphide ores will probably cause disappointments before it is satisfactorily adjusted. The slightest over-roasting of the ore would cause volatilisation of the telluride, with great loss of gold, and if the telluride were present in bunches, the gold in it would be fused into pellets which could not be dissolved by cyanide.

and of telluride.

The richest telluride ore will, no doubt, as at present, be shipped away for smelting, but it seems likely that there will be a considerable loss of gold from the local treatment before the process becomes finally adjusted. Of the eventual success of the sulphide process there can, I think, be no doubt. Further valuable discoveries may be expected from time to time in the Associated, and the aggregate width of payable reef will probably be found eventually to be 150 feet.

Value of Associated shares.

The results of the first year's work with the full plant, together with the ore reserves which that period of development may be expected to open out, will, in all probability, give Associated shares a value of £8.



ASSOCIATED GOLD MINES.

View of Big Stope at 100 feet level, Australia East Lode.

Kalgurli.

Kalgurli.—Capital, £120,000. I deal with this mine next because it is contiguous to the Associated on the Australia hill, and owns the continuation of the Associated lodes. In the Kalgurli, the payable seams are all found close together, and appear to aggregate 90 feet of ore. The length of the rich chute is not very great, probably from 250 to 300 feet, but, taking into consideration the great width of reef, there is enough ore in the Kalgurli to make a fine mine.

Ore tonnage.

Speaking approximately, there should be in Kalgurli 200,000 tons of ore above the 400 foot level, which should yield £4 per ton profit, equal to £8 per share.

Here, too, as in the Associated, fresh discoveries of value may be expected during the next two or three years, while the immense ore bodies in the mine are being explored. A lot of valuable time has been wasted in the development of the Kalgurli mine, and in the erection of a plant it is quite eighteen months behind the other mines in the neighbourhood. There may be some excuse for the postponement of the erection of a plant. The ore is nearly all sulphide, and the management feared to experiment on a dry crushing and roasting treatment which might turn out a failure. On the other hand, there was no excuse for delaying development in the mine; the ore was turning out well, so that there was no risk in putting money into development work. Such a course would have entirely reassured shareholders, who were being asked to wait an unduly long time for actual results, and would have placed the mine in a sounder position before the public than it has really occupied.

Profits and dividends.

When the sulphide plant starts, the monthly tonnage treated will probably be 3,000, which will eventually be increased. The profit from this should be £1[illegible],000, or, say, a dividend of 100 per cent.

The one drawback to the value of Kalgurli shares, as a sound investment, is the fact that the mine is hardly sufficiently developed to enable one to speak with certainty about the future. There is, however, a strong probability that after a year's run, taking into account the ore opened up in the meantime, the shares will be found to be worth, intrinsically, £10 each.

Lake View.

Lake View.—Issued capital, £250,000. In many respects the Lake View must be looked on as the leading mine in West Australia. Its management has been that of the scientific American sort, as opposed to the slovenly work which so often passes for management in the colony. In development, surface equipment and method, it has for years held the lead, while in the adoption of new processes, and in experiments, it has always borne the burden and the cost.

The financial control, and direction of affairs in London has not, I consider, reached a similar standard.

The mine.

The lode is opened for a distance of 2,700 feet. At the north end of the mine the lode, containing payable gold, enters from the Boulder Perseverance. It traverses the Lake View throughout, and contains 2,200 feet of payable ore, with an average width of 13 feet for the whole distance. At the southern end of the mine the lode becomes valueless, and passes out of the Lake View into the Lake View South, carrying only a few dwts.

The lode to 300 feet deep, that is to say, to the third level, continues to exhibit the same characteristics as those just described; that is to say, it is payable for a distance of, in all probability, 2,200 feet in length, and 13 feet in width. At an average depth of 100 feet the ore becomes sulphide; in many places considerable quantities of telluride ore are found disseminated through it, and for some distance along the 300 foot level this telluride was found richer than at any higher level.

Ore reserves and value.

There is, without any doubt, above the third level, ore, oxidised and sulphide, to last for a number of years, and of high enough value to yield 30 dwts., or £4 per ton profit.

The bottom of the mine.

Below the third level the mine has suffered its first setback. The reef continues, but where first developed is found to be of little value, and boreholes are being put in with the object of locating the rich ore which has so suddenly disappeared. Doubtless, before this is in print, payable ore will have been found in several places below the 300 foot level, and the future of the mine will again appear unclouded. In any case, I cannot consider this temporary failure to find rich ore in the bottom, as of first-rate importance. A run of rich ore, 2,200 feet in length, which is proved for certain to exist to 200 feet deep, and more than half of which is already proved to 300 feet deep, cannot suddenly cease below the latter point. Large patches of unpayable ore, in a lenticular formation, such as the Lake View, may easily be discovered, from time to time, without really damaging the continuous value of the mine.

Again, in two adjoining mines, Associated and Great Boulder, the lodes are already proved to 500 and 600 feet, carrying as good gold as ever, and with no signs of the lodes narrowing or being lost.

My definite opinion, whatever value it may carry with shareholders, is that the temporary failure to find payable ore below the 300 foot level is of no real significance, and considering the undoubted value of the mine above that level, already proved, they should not sell their shares in alarm.

London control of Lake View is doubtful.

With regard to the control of the Lake View, in London, some little doubt must be expressed. The group which controls this mine has been responsible for an immense amount of company flotation, not only in West Australia (where six or seven of its worthless mines were recently reconstructed under the name of the Standard Exploration Company), but also in British Columbia.

In both West Australia and British Columbia the control of its affairs has been so weak and so lax, and the really valuable assets that it possessed have been so poorly handled, that one cannot but fear the same control when applied to such a fine mine as the Lake View. Apparently the persons who control this group are intensely ignorant of sound mining methods, and evidently care for nothing except the market side of the question, reconstructions, fresh issues of scrip, and such like. Are independent shareholders in Lake View acting wisely in trusting their affairs to this group of men? I venture to doubt it.

Probable dividend.

The Lake View, finally, should have no difficulty in paying 100 per cent., or even a little more, for a number of years to come.

By the time this appears in print, the sulphide plant will have started to work, and as this is increased from time to time the eventual working out of the oxidised ore will not be felt.

On the immense asset of rich ore in sight, the shares cannot be considered over-valued at £10, and eventually, when, say, the 500 foot level has been reached, and payable ore found there, they should reach a higher figure.

Great Boulder.

Great Boulder.—Issued capital, £160,000 in 1,600,000 shares of 2s. each. This very fine mine, originally the best known in West Australia, and for a long time the leading producer there, has been somewhat obscured by the wonderful developments at Associated and Lake View. The unpleasant incident of the milling contract, too, has lowered the mine in the estimation of the public, and, perhaps, even of the shareholders. As a matter of fact, however, the Boulder, as a mine, is a very fine property, and must not be lost sight of as still in the front rank of West Australians.

Past policy has been bad.

The past policy of the company has been unsound. For years the mine has been picked to keep up an output of over 2 ozs. per ton—which is a considerably higher figure than the mine ought to yield if worked as a mine should be worked. Large quantities of ore assaying from 6 to 12 dwts. have been left behind, and are now almost unget-at-able. This grade of ore, as it was already developed, could have been worked at a profit. The failure to do this, and to have picked the mine instead, throws a considerable doubt upon the capacity of those recently in authority.

Then, again, at the time of my visit, no preparations had been made for the treatment of sulphide ore, and this in the face of the manager's yearly report, issued about the same time. Since then a good deal more free milling ore has been met with, but, in any case, at no distant date, the mine will have to rely upon sulphide ore to a considerable extent.

Great value of tailings.

The tailings of the ore already milled, which will yield a profit of several hundred thousand pounds, have been lying for years untreated. The reason given for this strange neglect was that the company was waiting for a satisfactory process for their treatment. This excuse was palpably weak, because Kalgoorlie tailings are easily treatable by cyanide, and all the time the adjoining Lake View mine was cyaniding much less valuable tailings with great profit. It was a natural conclusion of this that shareholders should show a suspicion as to the ultimate destination of these tailings, and their suspicion was greatly strengthened when it was found that the directors and late consulting engineer of the company had entered into a contract for the treatment of these, by an unknown process, and with a man who had already made a failure of a somewhat similar process in the United States. The terms of the contract were extraordinarily complicated, and led, quite justifiably, to a strong protest on the part of shareholders. The directors plainly showed their ignorance in making such a disadvantageous contract on the company's part, the more so, it appears to me, because I understand from the company's consulting engineer in London that the secret process is merely the cyanide process with one or two slight alterations, which, it is assumed without trial on a commercial scale, are so good as to warrant the company in parting with a considerable portion of the gold won.

Unfavourable contract to treat tailings attempted by directors.

It is satisfactory to learn that the consulting engineer who recommended this process, and who was responsible for the past policy of the Great Boulder, is not now in that company's employment.

The present management is sound, but must not be interfered with, on technical questions, by the London Board.

The yield per ton should be brought down to 30 dwts. This will admit of the fair working of the mine. A sulphide plant must be immediately erected. For the treatment of tailings on hand, as well as for those to be made in future, the ordinary cyanide treatment, uncomplicated by any patent process, is quite good enough. The shareholders, too, retain the gold won for themselves.

The value of Great Boulder.

As to the value of the Great Boulder, run on its merits, one is bound to speak eulogistically. The mine is developed to 600 feet, at which point the various lodes retain their size and value. There are four or five payable lodes in the mine, and the payable ore which may safely be assumed to exist above the 600 foot level will certainly be enough to permit of present returns being maintained for a number of years. More ore will in future have to be treated to produce the same profit as at present, but this can easily be done: the mine, too, will then be worked on a fairer basis than at present; now it is being picked.

The dividend.

There is every reason to think that the Great Boulder can continue to pay 100 per cent., and more for many years to come, and the shares at rather over £1 may always be looked upon as a safe and good investment.

Ivanhoe.

Ivanhoe.—Issued capital, £1,000,000 in 200,000 shares of £5 each.

Already a year ago there were 125,000 tons of ore in sight in this mine, estimated to yield a profit of £500,000. Since then developments in the mine have been excellent, and the monthly returns show that the estimate was not an exaggerated one.

This fine mine is soundly managed. There are, as in Great Boulder, several payable lodes, which show long continuous stretches of rich ore, of unusual width and great regularity. It is probable that the ore now in sight will show a profit of nearly £1,000,000 by the time it is worked out, and there is no reason to think that the mine will not be a permanent undertaking.

Profits.

At present, forty stamps crush about 3,000 tons a month, and yield more profit than the £12,000 estimated in my table of values. More stamps will doubtless be erected and the dividend correspondingly increased.

There is an unusual quantity of free milling ore in the Ivanhoe, continuing in places to 300 feet deep. This is a fact of great value as it allows a cheaper cost, and obviates the necessity of erecting a sulphide plant for some years to come.

Ivanhoe shares, comparing them on the same basis as the other Kalgoorlie dividend paying mines, are probably worth nearly £7.

Golden Horseshoe.

Golden Horseshoe.—Issued capital, £1,500,000 in 300,000 £5 shares.

This great mine has a curious history. Of its four reefs the eastern is infinitely the most valuable: in fact, this reef is the richest lode being worked in any gold mine that I know of.

This east reef twists into the Horseshoe property from the Great Boulder, remains in the Horseshoe for about 400 feet, and then twists back into the Boulder, where it also forms the richest section of that mine.

At the 100 foot level of the Horseshoe (the depth reached at the time of my visit) the east reef was only two feet clear of the Boulder boundary. Even then the ore exposed was of enormous value, but there was a strong probability that the slightest change of dip in the reef, or even a small fault, would carry the reef back again into the Boulder property, and that it would be lost to the Horseshoe.

An extraordinary mine,

Luckily for the latter company this did not happen. At the 200 foot level the reef was eight feet clear of the boundary, and at the 300 foot it was, I believe, twenty feet clear. For all this depth the lode continued to carry fabulously rich gold, and the whole 400 feet, from boundary to boundary, was highly valuable. Not only this, but several other reefs, not thought to be of great value, were found to be improving in depth, and the aggregate of all the ore developed brought the mine into the very first rank. It will be remembered that the manager in his last report stated that the ore in sight was 292,000 tons, worth £2,800,000, nearly £10 per ton, and from recent crushings one is forced, almost against his judgment, to believe in the excessive value of the ore in the mine.

But it is necessary to utter a strong word of caution. Gold is rarely found in such quantity as this over a large area, and there is every reason to think that the ore will get poorer in depth. Even then the mine may still be the richest in Kalgoorlie, and be a highly payable concern, but it would be in the last degree unwise for shareholders to reckon that the present returns can be kept up indefinitely, and therefore for them to capitalise the present enormous dividend of from 300 to 400 per cent. down to a 10 per cent. basis.

but still speculative.

It is true that the stamping capacity should be increased, and slimes works erected, and, of course, the mine will continue to be a most fascinating one to speculators, but the strong assumption is that present returns will fall to a more natural basis, and that in depth the ore will become distinctly less rich.

Whatever be the history of this mine for the next year or two, the shares are sure to fluctuate greatly, and it is almost impossible to name a price at which they may be considered a sound investment. The Horseshoe has proved itself a great and unique mine, but through its present excessive richness it has prevented a correct valuation of itself for investment purposes, and even its speculative value is at present purely a matter of guesswork.

Great Boulder Perseverance.

Great Boulder Perseverance.—Issued capital, £175,000. This mine has, or had, the distinction of being the worst opened out, and most secretively run mine at Kalgoorlie, which is saying a good deal, and it is the only important gold mine in the world to which I have been refused admittance—for the Perseverance *is* an important mine, without question, although it used to be worked like a rabbit warren.

Several payable sections of lode are found in the property, one of which is the Lake View lode, and there is reason to think that in the course of explorations further discoveries may be made. No estimate is possible as to the ore in sight, tonnage likely to be treated monthly when the mine has its own plant, or profits. If shareholders are satisfied that the inherent merits of the mine are such that, despite want of development, lack of information, and a general policy (until lately at least) of stagnation, are only temporary features, then they are justified in sticking to their shares. As a matter of fact the mine is sure eventually to survive all this, and although no estimates of value are possible, the shares are probably worth at least from £4 to £5 on intrinsic merits.

Hannan's Brownhill

Hannan's Brownhill.—Issued capital, £110,000. This much discussed mine has formed food already for many printed reflections, and it is to be hoped that the present contribution may help to the elucidation of a knotty question.

The property is situated more than a mile away from the other seven rich mines at Kalgoorlie, which, as has been several times stated, are altogether in a clump.

The lode, or gold-bearing matter, is of an essentially different nature, too, to that of the other mines. It is, to my mind, a large deposit of schistose material, rather than lode matter proper, and the gold is purely a local deposit, inhabiting the schist to a certain depth, but not going down with the lode.

is apparently only a schist deposit—not a lode.

This schist deposit is, in places, sixty feet thick in rich gold, and aggregates several hundred feet in length. It extends, but in irregular waves, to about 300 feet deep, with a dip to the south, but at that point it appears to have nearly died out. In a level put in underneath this, the lode itself, which seems to emerge about here from the mass of schistose material, is found, but carrying little gold until the contact with the schist mass takes place, far in the level.

In a lower level still, which I was not allowed to see, the lode is quite unpayable. The best assay from here was 17 dwts. At this depth the gold-bearing schist appears to have entirely disappeared. The natural result of all this is to assume that the Hannan's Brownhill mine is, therefore, merely a local deposit, of considerable area and value while it lasts, but rapidly narrowing down below 300 feet, and probably dying out entirely before 500 feet. In other words, the bottom of the mine has been reached, and all the payable ore in the mine has already been discovered.

The lowest levels are poor.

This theory I firmly believe to be the correct one. Of course the directors will fiercely controvert such an opinion, and can no doubt use arguments against it which at the time are apparently very telling. Time will show, however. In the meantime shareholders in Hannan's Brownhill need feel no alarm. Whether the gold is in schist or in lode matter may be doubtful, but there is no doubt whatever that there is a lot of gold in the mine. My estimate a year ago was 160,000 tons in sight, worth £1,000,000, which would yield a profit of £6 per share.

Amount and value of ore in sight.

Since then not much more ore has been developed, but I have reason to think that the profit on that in sight may be placed at £8 or even £9 per share.

Dividends.

This profit, which is probably the total profit that the mine will produce, will be earned over four or five years. According to this calculation, Brownhill shares are not worth more than £6 or so, but a little margin may be allowed for a possibly too conservative estimate of the ore in the mine.

Special dry crushing process.

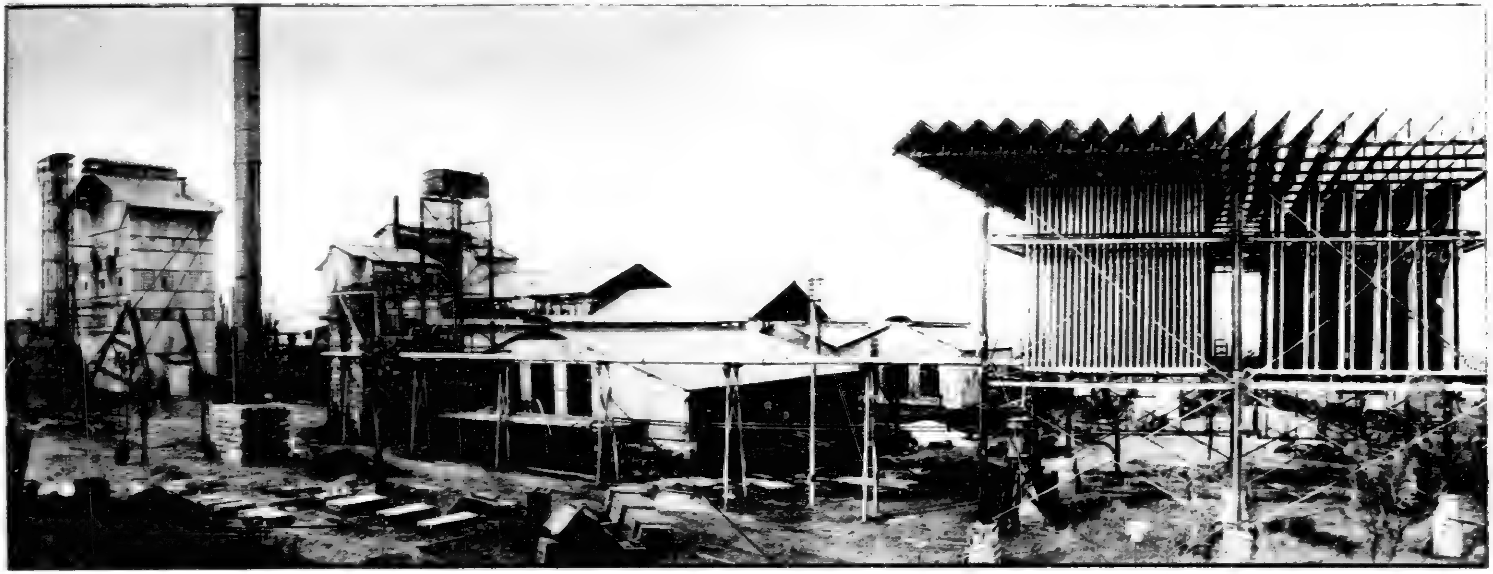
Were this a technical book a most interesting account might have been written of the process in use here for treating the ore. Briefly described, the ore is put through crushers, dried, and finely crushed by ball mills. The sand is then separated by a current of air into three products: (*a*), Heavy sand and free gold, which is amalgamated first and then cyanided; (*b*), Ordinary sand which is cyanided direct, and (*c*), Fine sand or slimes, which is treated separately; the cyanide solution being forced through the slimes by pressure.

Second-class Kalgoorlie mines.

We now come to a discussion of the second-class mines on the Kalgoorlie field, none of which, as must be carefully realised by investors, are nearly as good as the eight mines already described.

Seventeen of these.

The number of these second-class mines cannot be definitely stated, but, from a five weeks' residence on the field, and an inspection of over twenty of the mines, I have placed it at seventeen.



HANNANS BROWNHILL GOLD MINE.

All of these are entirely speculative ventures. Some of them may eventually be successful, but most of them will certainly be failures. In the meantime, owing either to their situation in relation to rich mines, or to the fact that they have actually found some payable ore, they are of interest to speculators, and their chances are worth careful consideration.

Some have a small quantity of payable ore.

(*A.*) SECOND-CLASS KALGOORLIE MINES THAT HAVE FOUND SOME PAYABLE ORE, BUT WHICH ARE NOT YET PROVED PAYABLE:—

Great Boulder Main Reef.
Brownhill Central.
North Kalgurli.
South Kalgurli.
Hainault.
Hannan's Star.
Brookman's Boulder.
Golden Pike.
Kalgoorlie Mint and Iron King.
North Boulder.

Some are merely well located.

(*B.*) SECOND-CLASS KALGOORLIE MINES THAT HAVE AS YET FOUND NO PAYABLE ORE, BUT WHICH HAVE A SPECULATIVE VALUE AS REGARDS THEIR NEARNESS TO RICH MINES:—

Chaffers.
Brownhill Extended.
Golden Link.
Hannan's Oroya.
Lake View South.
Central Boulder.
Great Boulder No. 1.

Boulder Main Reef.

Great Boulder Main Reef.—Issued capital, £120,000, in 240,000 shares of 10s. each. This is the best of the second-class Kalgoorlie mines, in so far that it possesses, adjoining the Great Boulder Boundary, a patch of really rich ore, 170 feet long.

This will probably continue in depth, and as several stringers of payable reef are thrown out here, which help the aggregate tonnage, there should always be enough payable ore in the mine to keep a small plant at work.

The free-milling ore is now exhausted, and until the company has erected a plant to treat sulphide ore, it will have mainly to depend on the yield from the old tailings that are now being treated at a profit. The mine is good—so far as 170 feet of a narrow reef can be said to constitute goodness—but is essentally a small affair; and at anything over 15s. the shares would seem to be over-valued.

Brownhill Central.

Brownhill Central.—Issued capital, £200,000.

I take the following remarks verbatim from my note-book:—

"Cash in hand £40,000. A soundly managed mine, which is still in the prospecting stage. The shaft is down to 300 feet. From the surface to the 100 foot level is a chute of ore 170 feet long, three feet wide, and assaying 1 oz. The ore is free milling. At 200 feet, a cross-cut put into the reef proved it fifteen feet wide, and only worth a few dwts. The cross-cut at 300 feet had not reached the reef."

This mine is in a poor locality, and I am inclined to think that the small chute already discovered will not continue in depth. The value of the lode at 200 feet would seem to point to the same conclusion. Evidently recent results have been poor, as no discovery of value in depth has been announced. These shares are purely speculative.

North Kalgurli.

North Kalgurli.—Issued capital, £150,000.

At the time of my visit to this property a reef known as the Eastern Reef was being developed. The 275 foot level had been driven 400 feet, exposing a chute of fairly rich ore, and the manager estimated that to this depth there were 30,000 tons of payable rock in sight. There were indications that this chute of ore was of irregular value, and might not continue in depth.

Since that time the company has made great efforts to find the continuation of the valuable bodies of ore in the Kalgurli mine.

It was assumed, as a matter of course, that the rich Kalgurli ore, aggregating 90 feet thick, would pass into the North Kalgurli. But, as a matter of fact, the rich patch gives out long before the reef reaches the boundary of North Kalgurli, and in all probability the mass of ore after leaving the Australia hill will be found to have narrowed down to an ordinary width.

In any case, the North Kalgurli, at the 275 foot level of the East reef, put in a cross-cut to the west boundary. A continuation of the Kalgurli *was* found, but only sixteen feet thick and of low value. Up to the time of writing, driving on this lode in each direction has failed to discover any payable ore.

The company will probably find it best to again turn its attention to the East reef. It is by no means certain that there is, even here, any chute of ore of permanent value, but a considerable amount of work will have to be done to definitely prove this.

The company is carefully managed, but the shares can only be looked on as a speculation.

South Kalgurli.

South Kalgurli.—Issued capital, £105,000. The position of this property, as will be seen on reference to the map, is very good. But the rich patches found in the Kalgurli Associated, and Boulder Perseverance, have not been found to extend to this mine.

There are three lodes being developed, and on the eastern lode workings extend to over 400 feet deep. All of these lodes contain small patches of payable ore, but they are irregular, and the aggregate results to date are, in my opinion, of doubtful value.

The management of the property seems to be painstaking, but unwittingly the estimate of the value of the ore developed, and of the mine generally, is unduly optimistic.

Uncertainty as to ore valuation.

In 1897 the manager reported (he showed me a copy of the report) 22,000 tons in reserve, worth 25 dwts.

In 1898, the estimate, according to the Chairman's speech, was 31,000 tons, worth about 19 dwts. In other words, the year's work had resulted in adding 9,000 tons to reserve, and in reducing the average of the whole by 6 dwts.

In the face of this the shareholders, with cheers and general enthusiasm, voted for an increase of capital for the erection of a mill and cyanide plant.

Now, although the South Kalgurli has not been sufficiently tested to pronounce it an unpayable mine, I am strongly of opinion that it is being altogether overrated by manager, directors, and shareholders, and if they do not exercise particular caution, the mine will have to be added to the long list of West Australia failures.

If the mine is really a good one the management must produce much more convincing evidence on that point than it has done up to the present, and, pending that, the public should refuse to speculate in the shares.

Hainault.

Hainault.—Issued capital, £100,000.

In this mine are found the continuations of the three lodes which are being developed in the South Kalgurli, and their gold contents appear to be even more irregular than in that mine. Rich strikes are chronicled from time to time, but although the mine has been developed, on all these lodes, to 200 feet, it has by no means been proved permanently payable.

The location of the mine is, of course, excellent, but speculators must not be carried away by hearsay as to its value.

The shares last year stood at over £3, but at £1 their speculative value is, in the meantime, fully discounted.

Hannan's Star.

Hannan's Star.—Issued capital, £120,000.

As in the case of South Kalgurli, the management of this mine is plainly over estimating the value of ore developed. The figures given to me were, 20,000 tons worth 34 dwts. recovery. But those responsible for this estimate forget two things:—Firstly: The assays included individual results of 12 or 15 ozs. High assays such as these should never be included in an estimate of ore values. Secondly: The width of reef is only eighteen inches, so that a very large proportion of waste rock will be blasted down with lode matter which will materially reduce the value of the product going to the mill.

There is no doubt but that the average value of the mine, over any long period, is from 12 to 15 dwts. only—not

34 dwts., and should the first few months' crushing work out at more, then the shareholders will do wisely to pass their shares on to some less critical purchasers.

As a matter of fact, the mine is not yet proved to be permanently payable, and the shares have only a speculative value.

Brookman's Boulder.

Brookman's Boulder.—Issued capital, £175,000.

When I was at Kalgoorlie, and for months afterwards, the local press was reporting almost every day, the great value of the ore being developed at the 300 foot level in this mine. It was stated by the manager to be of much greater value than any found at a shallower depth. When it came to be milled, it was found that it was unpayable. I inspected the mine and consider it worthless.

Golden Pike.

Golden Pike.—Issued capital, £95,000.

At 400 feet a rich strike was made in this mine, which I inspected at the time. Since then a lot of development work has been done, but the ore, with the exception of this one small patch, has returned to the value of the upper levels—which was a few dwts. only. The mine may be considered, I think, valueless.

Kalgoorlie Mint and Iron King.

Kalgoorlie Mint and Iron King.—Issued capital, £200,000.

This is a poor mine, despite the fact that it had some payable ore in the upper levels. There are several reefs, but a great deal of dead work has to be done to develop even a small quantity of rich ore, and the mine can never pay. It is soundly managed, but is apparently in a hopeless condition.

North Boulder.

North Boulder.—Issued capital, 220,000 10s. shares.

At the time of my visit, this property was coming strangely near to the end of its existence. The reef being worked—apparently the only payable reef in the mine—will pass into the Associated at about two levels below that now being stoped. To add to this was the fact that the ore in the bottom was of poorer value, and that the length of chute was not very great. The mine in the past has produced some good ore, but I venture to say it will never pay another dividend.

Chaffers.

Chaffers.—Issued capital, £87,500 in 437,500 shares of 4s. each.

Chaffers is an extremely well located property, and might at any time, in developing to a deeper point than that now reached, pick up one or other of the numerous rich lodes found close at hand in the Great Boulder and Golden Horseshoe. In the meantime, developments have been disappointing. For a long time no ore at all was found. Then a few narrow stringers, but not payable in the aggregate, were met with in depth. So far, to summarise the position, nothing of value has been found, but there is a possibility that deeper workings may discover really rich ore, and on this the shares have a distinct speculative value.

The company recently raised £17,500 by issuing 70,000 new shares, and this money will be devoted to deeper exploration.

Brownhill Extended.

Brownhill Extended.—Issued capital, £75,000.

Shareholders in the Brownhill Extended, a mine which down to 400 feet had never produced a ton of payable ore, have set a considerable value upon their shares in the expectation that the rich patches of ore in Hannan's Brownhill, which are undoubtedly dipping in the direction of the Extended, and which are, at the 300 foot level of the former mine, actually proved to within 200 feet of the boundary, will pass in depth into their mine.

If shareholders in the Brownhill Extended will carefully read the description of Hannan's Brownhill, they will realise that the rich ore there is probably a local deposit, in schist, which continues to a certain depth, but which apparently dies out altogether at about 400 feet deep.

In this case it would be impossible for any of the Hannan's Brownhill rich ore, although it dips rapidly south, to pass into the Extended, because before the chute reached the necessary depth, some 600 or 700 feet, it will have ceased to carry gold. However, this is not absolutely certain, and shareholders in the Extended were quite justified in raising last year, by the issue of new shares, £10,000 for the exploration of their mine at a greater depth.

The problem is a pure speculation, but a justifiable one, so far as mining is concerned, and a speculative value will continue to adhere to the shares until the necessary deeper exploration has been accomplished.

Golden Link.

Golden Link.—Issued capital, £322,183. Cash and realisable assets, about £100,000.

The boundary of this mine is only fifty feet from, and the mine forms the deep level of, about one half of the Lake View lode. There is a very slight natural dip of the formation towards the Golden Link, and at some depth or other it is fair to assume that the Lake View lode will be found. But the dip is very slight. Between the 200 and 300 foot levels of the Lake View, exactly opposite to where the Golden Link shaft is, the dip is only *two feet in one hundred*. At this rate the reef would not be found in Golden Link until a very great depth had been sunk. In the face of this evidence, the management of Golden Link is continually raising false alarms to the effect that the reef will be met in another hundred feet, or 28 feet, or some other marvellously calculated distance. In spite of these false alarms, most unjustifiably circulated, the shaft has been sunk in barren ground to 200, then to 400, then to 600 feet. I do not know what is the precise depth at present, but the deeper it goes the fewer become the false alarms—which is a satisfactory feature.

Cross-cutting in Golden Link has so far failed to locate any reefs whatever, and attention will doubtless be mainly confined to sinking the shaft.

The company owns some other properties, but these are worthless, and should be abandoned.

The position of Golden Link will always give a considerable speculative value to the shares, and the cash position of the company is excellent.

Hannan's Oroya.

Hannan's Oroya.—Issued capital, £120,000.

It will be observed on inspection of the map, that the Oroya owns two blocks of ground, each block adjoining part of the Associated ar [illegible]

The North Block is being worked. The reef is probably an extension of the North Boulder lode. In the free-milling ore it produced a certain amount of rock which, on careful management, just paid for treatment. This is now practically worked out. The sulphide ore in the bottom, which I carefully inspected, is of lower value, contains practically no telluride, and is unpayable. This block, to my mind, is quite valueless. It is on the prospective value of the South Block that I consider a great speculative value attaches itself to the shares. This block adjoins the workings of the No. 6 shaft of the Associated, where the reef is payable for a width of eighty feet, and it is almost certain that this wide reef carrying payable ore continues up to the boundary of the Oroya.

A year's development in this locality will doubtless decide the value of the block one way or another. The chances are that some payable ore will be found, but it is not safe to assume that there will be enough to make a permanent success. At any rate, it is on this point that shareholders and speculators must concentrate their attention for the future.

Lake View South.

Lake View South.—Issued capital, £150,000.

The Lake View lode runs all through this property, but it has ceased to become payable for 200 feet before entering the Lake View South ground, and continues to be very poor all through the mine. A well erected mill has been put up. This crushed for some time, but always at a loss, and it has now been leased to another mine. All that the Lake View South shareholders can do is to sink the shaft to 1,000 or 1,500 feet to test the reef at that depth. The prospects are of the poorest.

Central Boulder.

Central Boulder.—(Since reconstructed as Central and West Boulder).

This little property is excellently situated, but despite this fact, and also that there are several reefs known to exist, and already partially developed, the mine has been shut down for a long time. The stagnation at this mine is, indeed, a mystery, and reflects on the control. The mine should be systematically explored, and if it is short of funds shareholders may justifiably raise £10,000 or £15,000 for the purpose.

Great Boulder No. 1.

Great Boulder No. 1.—Issued capital, £225,000.

Although located on the direct line of the Boulder reefs, and actually containing those reefs, not a single ton of payable ore has been found in the mine. The ten-stamp mill, erected somewhat prematurely, it would seem, is leased to the Great Boulder.

The shares are intrinsically worthless.

This completes the account of all the mines on the Kalgoorlie field which are worth consideration. The great majority, which have not yet been referred to, are absolutely worthless. Many of these mines are still being actively developed, and to judge from press notices and accounts of meetings, one would think that every one of them is likely to turn out well.

People who buy shares in these mines have only themselves to blame.

Worthless Kalgoorlie mines.

A list of these worthless mines would probably offend the susceptibilities of numerous worthy individuals.

There are twenty-two mines which introduce the name "Hannan's" into their titles, and there are also numerous "Boulders," "Lake Views," "Brownhills," and "Associateds."

The managers of many of these mines do not hesitate, when they meet a congenial spirit, to roundly denounce their worthless properties. Their opinions also of the cliques in London who have floated these concerns, and who continue to act as directors of the same, would not be particularly pleasant reading to those worthies.

Kanowna.

Twelve miles from Kalgoorlie, and connected with it by rail, is Kanowna. This has been an important alluvial field for some years past, giving employment to from 5,000 to 8,000 diggers, but a number of reef mines were also floated here at an earlier period.

Of these a number never reached a crushing stage, but there are several now at work on a small scale which may be briefly referred to.

Robinson.

Robinson, with a capital of £80,000, paid several dividends up to the end of 1897. This was remarkable, inasmuch as the reef, of pure white quartz, an admittedly treacherous sort of rock, has no regular dip, is much faulted, and altogether unreliable. Recently the ore in sight became exhausted, and it seems doubtful whether the mine can ever again crush for any extended period. The mill is leased to alluvial diggers.

White Feather Reward, and Main Reef.

White Feather Reward, and **White Feather Main Reef** are two mines at Kanowna which work along in a hand to mouth style, and manage to pay a small dividend now and then. Occasionally they shut down because there is no ore in sight. Then after a few months engaged in looking for more ore, they come upon a small patch which yields a little profit. These concerns, whether they pay dividends or not, are essentially dangerous, and may give out any day. Investors should note this.

Bulong and Kurnalpi district.

At Bulong, and at Kurnalpi, in the Kalgoorlie district, groups of mines have been floated in the early days, but the reefs here are most treacherous, and, with the exception of the **Queen Margaret,** a hand to mouth concern, all are shut down never to be re-opened.

Queen Margaret mine.

Broad Arrow district.

In the Broad Arrow district, which I did not visit, a great number of mines have been floated. One or two remain alive. The **Paddington Consols** is a low grade mine, which may be worked at a small profit, but this is by no means certain. The **Hill End,** belonging to the New Austral Company, and soundly managed, has been making fair profits for some time past. Its value in depth is uncertain.

Paddington Consols.

Hill End.

Menzies, 80 miles N.E. of Kalgoorlie, 450 miles inland from Perth, and the terminus of the railway, is a gold field of distinct promise.

Menzies district.

The reefs here are of a blueish quartz, heavily mineralised, lying in an exceedingly hard and wonderfully regular formation, and giving every appearance of continuing in depth. The gold, as usual in quartz, is contained in clearly defined chutes, and nearly all the ore not in the line of the chutes, may be considered as unpayable. Water is exceedingly scarce. It is supplied to the mine, in a brackish state, by the Menzies Waterworks Company, at the rate of 25s. per 1,000 gallons, and can only be used with difficulty.

Geological.

The drawbacks to mining at Menzies are:—

(1) Scarcity of water.

(2) Excessive hardness of the rock.

(3) Small area of chute ore in most of the mines, owing to their limited claim holdings, and to the fact that the chutes dip rapidly across most of the leases.

Drawbacks to mining at Menzies.

Against these drawbacks is the fact, that there is already a fine mine developed at Menzies, the Lady Shenton; a fairly good mine in the Queensland Menzies; and a number of known chutes of ore belonging to other companies, which, in time, even under the great drawbacks prevailing, may be made payable.

The **Lady Shenton,** issued capital, £160,000, is one of the ten best mines in West Australia. The chute now being worked is 700 feet long. At 400 feet deep the reef has widened, in places to 12 feet, and gives every appearance of

Lady Shenton.

continuing in width and value to a great depth. The mine, up to the present, has been picked to yield an average of about $2\frac{1}{2}$ ozs. to the ton, worth 71s. per oz. Some ore of lower, but, nevertheless, payable value, is being unjustifiably left behind. This should be stopped. The mine is not equipped nor worked on a scale commensurate with its value. There are 30 stamps, it is true, but they only crush about 700 tons a month. There is no tailings plant, the manager fearing to tackle the copper which is found in the tailings; and these, of an average value of at least 15 dwts., are lying unproductive.

The mine should be actively developed with rock drills.

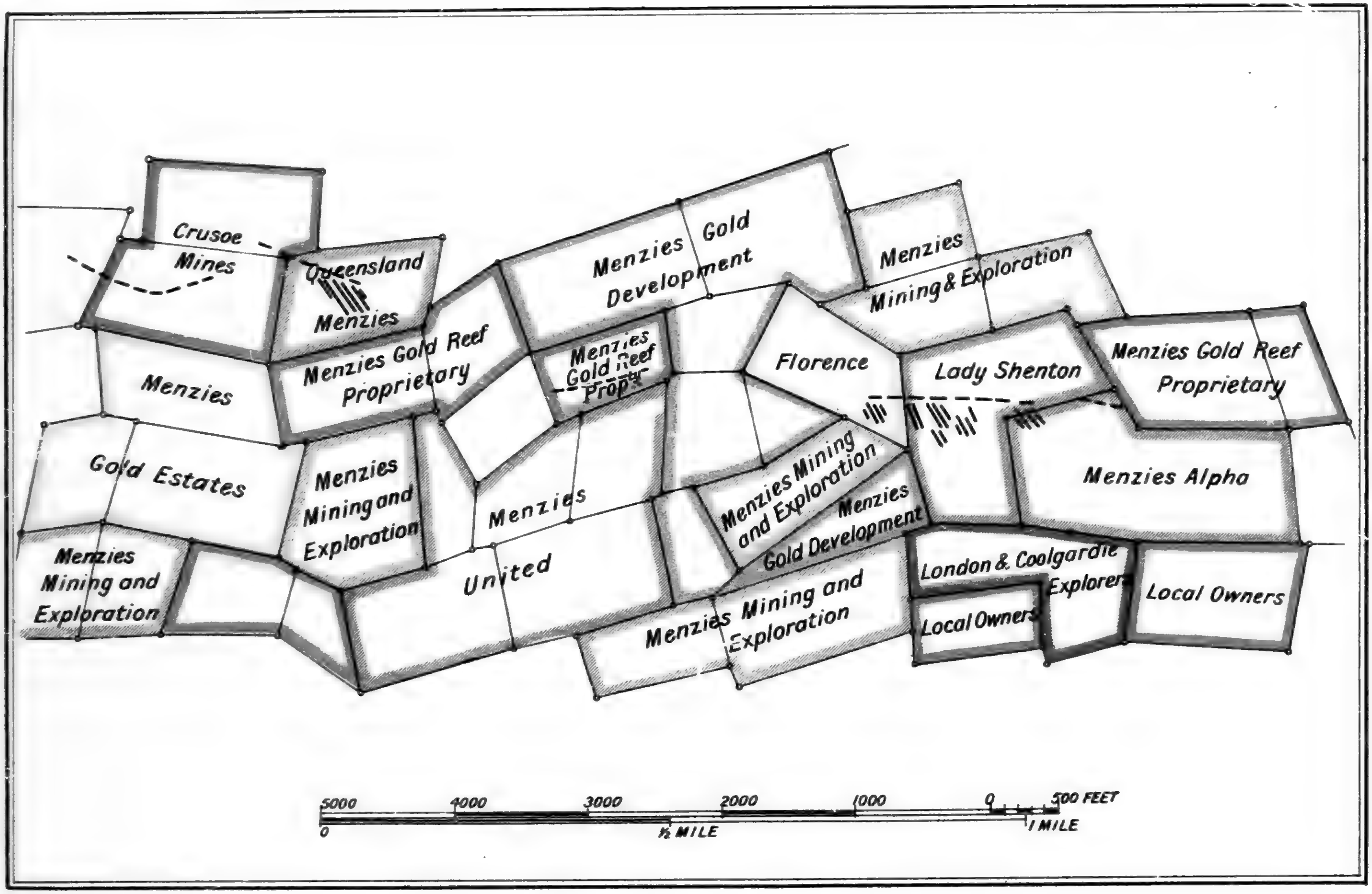
The mine must be more energetically developed.

Menzies is a new district; the value of the reefs in depth is unknown, and, as the mine has commenced to pay handsome dividends, of from 20 to 30 per cent., and is now capitalised by shareholders, on a 10 per cent. basis, they should spend money in finding out, at the earliest date possible, if the ore really continues in depth as good as it is at present, and whether dividends will continue, or whether the eighteen months' or two years' ore in sight is all there is left.

There is, of course, a strong probability that the reef *will* be found to continue good in depth, but, all the same, it is a duty shareholders owe to themselves to ascertain this at an early date.

Menzies Alpha.

Menzies Alpha.—Issued capital, £100,000. This is the deep level of part of the Lady Shenton property, and a considerable piece of the rich chute in that mine should, with certainty, dip into the Menzies Alpha at a comparatively shallow depth. A shaft is being put down to cut the Shenton reef at an estimated depth of 600 feet, but it is being sunk at an extraordinarily slow rate. The excuse is that the rock is exceedingly hard, but, if this is the case, the company, in order to make at the earliest date an important strike, such as this may be, should buy an air compressor, and work drills. Another narrow reef, yielding ore worth 4 ozs. to the ton, is being worked, and enough ore is produced from this to have a small crushing every


Crusoe Mines
Queensland Menzies
Menzies Gold Development
Menzies Mining & Exploration
Menzies Gold Reef Proprietary
Menzies
Menzies Gold Reef Prop'y
Florence
Lady Shenton
Menzies Gold Reef Proprietary
Gold Estates
Menzies Mining and Exploration
Menzies
Menzies Mining and Exploration
Menzies Gold Development
Menzies Alpha
Menzies Mining and Exploration
United
Menzies Mining and Exploration
London & Coolgardie Explorers
Local Owners
Local Owners
5000
4000
3000
2000
1000
0
500 FEET
0
½ MILE
1 MILE

GOLD LEASES AT MENZIES, W.A.

few months. It is, however, on the Lady Shenton lode that the prospects of the company rest, and all attention should be devoted to the vertical shaft. The shares, to my mind, have a considerable speculative value.

Florence.

Florence.—Issued capital, £120,000. One corner of this mine, adjoining the Lady Shenton, contains the continuation of that rich chute, and is undoubtedly valuable. At the time of my visit to the mine, a drive from the third level of the Shenton had been carried, on good ore, 130 feet into the Florence. There is probably too little payable reef in the mine to justify the Florence in working it itself, but the corner containing the rich ore might be sold for a considerable sum to the Lady Shenton.

The shares are speculative.

Menzies United.

Menzies United.—The reef known as the "Friday" was cut in the shaft at about 400 feet deep. The reef is from one to two feet thick, well defined, but only assays 16 dwts. or so.

This value, on a narrow reef, at Menzies, is barely payable. The company has funds, and in the course of exploration might find some richer ore.

In the meantime the shares are a doubtful speculation.

Menzies Gold Estates.

Menzies Gold Estates.—The three blocks owned by this company, on the dip of the Menzies Crusoe, are poorly located. It is expected the shaft will cut the reef at 600 feet, but it is doubtful whether any rich ore will be met with.

The shares are entirely speculative.

Menzies Consolidated.

Menzies Consolidated.—Situated four miles from the other mines of the Menzies field. The reef is narrow; it has already been worked down to about 250 feet without yielding a real profit, and there is no reason to think that the mine can ever become permanently payable. There is a fairly good water supply.

The shares are a poor speculation.

Menzies Gold Reefs Proprietary.

Menzies Gold Reefs Proprietary.—This Company owns several mining leases at Menzies; a number of shares in other local companies, and over £30,000 in cash.

As to the claims:—The "Friday" lease has been extensively worked, but is unpayable. The reef is narrow, and dips out of the property at a shallow depth.

The "Lady Shenton No. 1" lease is being developed, but is no good.

The "Nada" and "Defoe" leases probably contain the dip of the Queensland Menzies chute, and therefore possess a speculative value.

The Company's shareholdings consist of the following:—

34,400	Menzies Crusoe.
12,667	Menzies Consolidated.
10,000	Menzies Waterworks.
8,626	Kalgurli United.

Menzies Gold Reefs shares have a value of 8s.–10s.

Menzies Crusoe.

Menzies Crusoe.—This mine, which is being developed in a somewhat haphazard fashion, has a few thousand tons of payable ore in sight. Every month or two there is a crushing. The mine has its own mill and cyanide plant, and makes, perhaps, a small profit per ton. Worked on its present scale, however, the Crusoe cannot pay dividends. If it is found out that the chutes are well defined, and continue in depth, rock drills must be put in, and the ore worked systematically to produce a regular output. On the present basis the mine cannot pay profits.

The shares are only speculative.

Menzies Mining and Exploration.

Menzies Mining and Exploration.—Issued capital, £249,900. An issue of £25,000 6 % debentures has been authorised.

This Company owns about eleven leases on the main line of reefs. Some of these are being worked with poor results. The most valuable blocks are the "Leonidas" and "Sherez," on the dip of Florence and Lady Shenton.

The shares are speculative, but not without value.

Menzies Gold Develop-ments.

Menzies Gold Developments.—This Company owns seven leases, but most of these are poorly located. The "Bantry" and "Pericles" on the dip of the Florence and Lady Shenton should prove valuable.

The shares are speculative, but not without value.

London and Coolgardie Explorers.

London and Coolgardie Explorers owns two valuable leases known as the "Liffey" and "Mersey," on the direct dip of the Lady Shenton.

Queensland Menzies.

Queensland Menzies.—Issued capital, £33,000 in 132,000 5s. shares. In this mine there are two narrow but rich chutes, carrying ore worth nearly 4 ozs. to the ton. The capacity of the mine is about ninety tons of ore monthly, but even at this rate there was practically no ore in sight when I saw it, and the mine is therefore existing in a hand to mouth state. The chutes will probably continue down, but at a comparatively shallow depth they will pass into the "Nada" and "Defoe" blocks of the Menzies Gold Reefs, so that the life of the Queensland Menzies will not be great.

In the meantime frequent dividends are paid, and the shares may be considered as intrinsically worth 10s.

Twenty-nine English flotations at Menzies.

There were, in all, twenty-nine English flotations in the Menzies district. The remaining mines, such as the Menzies Niagara, Menzies Gold Age, and Lady Sherry are no good.

The district summarised.

To summarise the position of the district, which, I again repeat, is worth the attention of mining men, we find the following result :—

Lady Shenton is a really fine mine.

Queensland Menzies is a good mine, but of limited life.

Florence has some good ore, though probably not enough to be worked by itself.

Menzies Crusoe is indifferent.

Menzies Alpha, Menzies Gold Reefs, Menzies Mining and Exploration, Menzies Gold Development, and London and Coolgardie Explorers, hold presumably valuable deep level claims.

All other mines appear to have poor prospects.

Mount Leonora.

Sixty-four miles beyond Menzies, in the heart of the bush, is the district of Mount Leonora, and here situated quite by itself, in regard to value at least, is another of the fine mines of West Australia.

Sons of Gwalia.

This is the **Sons of Gwalia.**—Issued capital, £300,000.

The mine has a schistose formation carrying gold, and is strikingly similar to some of the Kalgoorlie lodes, especially resembling them in the great width of reef which varies from five to forty feet thick.

At the time of my visit, the 100 foot level had been driven 1,100 feet, in soft ground, and along most of this distance the reef was wide, easily mined, and of exceedingly payable value.

At the 200 foot level only 100 feet of driving had been done, but the reef here also was five feet wide, easily mined, and of even higher value than above. The water supply in the mine was ample for forty or fifty stamps.

There was £155,000 profit in ore and tailings in sight at the time, and the ten-stamp mill taken over by the company from the prospector was turning out 1,000 ozs. every month.

The mine's assay plan.

Recently I inspected the assay plan of the mine, in London, and was glad to see that the reef showed every sign of becoming permanently valuable in depth.

The second level has been greatly extended, proving to date over 700 feet of payable ore, twelve feet wide, and worth 25 dwts.

The third level, 280 feet vertical, has been cut. The reef here is found in two seams, and is irregular in value, but certainly promises to be payable when more fully developed.

A thirty-stamp mill and cyanide plant has been ordered. The mine is soundly managed. On the whole there is every reason to believe that the Sons of Gwalia will become a sound and permanent mine, and when the fifty stamps get to work profits should be very considerable.

Value of ore in sight.

There is probably at least £300,000, or £1 per share profit, in sight already, and to speculators the shares should now be worth probably £2 10s. Some day they may stand considerably higher.

Star of Gwalia.

Adjoining the Sons of Gwalia, but a long distance from the rich chute, is the **Star of Gwalia,** issued capital, £135,000.

This mine was floated, as a pure speculation, on the strength of developments in the Sons of Gwalia, but I believe there is little chance of payable reef being discovered.

No doubt numerous other mines will be floated in the neighbourhood, all using, as nearly as possible, the name of the more valuable mine as an advertisement. The public will act very foolishly in subscribing for the capital of such undertakings.

Dundas.

In the southern part of the colony lies the Dundas, or Norseman Gold Fields. There are one or two mines here which yield fair results, but they are essentially small mines, and working now with as good results as they are ever likely to achieve.

Norseman Mine.

The **Norseman Mines,** a soundly managed company, with an issued capital of £200,000, has a fairly well developed mine with about 40,000 tons of payable ore in sight. There are twenty stamps, and a small monthly profit can be relied on.

For the next year or two, until much more is known about the continuation and value of the reefs in depth, the mine has only a speculative value, and the shares as a speculation may be said to be worth 8s. or 10s.

Princess Royal.

I did not visit the district, but was reliably informed that the **Lady Mary** and **Princess Royal** (not to be confounded with Princess Royal at Cue), were small mines with some little promise, while several others may reach a small profit-earning stage.

Yilgarn.

At Yilgarn or Southern Cross, a field worked before Coolgardie or Kalgoorlie were discovered, several small mines, notably Fraser's, Fraser's South, Central, Hope's Hill, and Golden Pig, have from time to time made small profits. It is said that most of the best ore, which was always low grade, has now been worked out, and the field at present is not worth the attention of speculators at a distance.

The Murchison.

I regret that I was unable to visit the celebrated Murchison Gold Field, which covers a large area of the northern part of West Australia. The few remaining mines at work there, however, are scattered over such great distances that the information gained from several months' travelling would hardly have been commensurate with the time occupied.

Speaking generally, this district, including Mount Margaret, Cue, Day Dawn, Nannine, Yalgoo, Nullagine, Marble Bar, and Bamboo Creek, has been a complete failure. There were, I estimate, sixty-six English flotations in these northern districts, of which only a fraction now survive.

Peak Hill.

The only mines which merit the attention of speculators are Peak Hill and East Murchison United. With regard to **Peak Hill** reports differ. It is probable that the mine has payable ore in sight to last for some time, but the shares are undoubtedly very speculative. Their value is difficult to determine.

East Murchison United.

East Murchison United is soundly managed, and promises distinctly well.

It, too, is speculative, because one cannot tell what may be the position of the mine two years hence. Occasional dividends will be paid, certainly for some time to come, and the shares may be considered good enough to buy at £1.

Worked out Murchison mines.

A number of well-known mines in the Murchison district, after having worked out rich ore, and in cases, after having paid dividends, are now in a struggling condition. These include :—**Consolidated Murchison**, **Belle Vue Proprietary, Champion Reef** (Nannine), **Morning Star, Mainland Consols,** and **Day Dawn North.**

Conclusion.

This concludes my description of West Australian mines. After having criticised the colony severely, though not unduly, I wish to put on record my opinion that West Australia promises to become, and to continue to be, one of the great gold-mining countries of the world.

In the meantime, an immense number of abuses have to be remedied ; a sounder system of mining, in all its departments, must be inaugurated ; and the country must, all the time, be thoroughly prospected. When promising things are found they must not be floated indiscriminately, but must be developed by local capital, or capital specially raised for exploration work. A *proved mine*, duly vouched for, will always sell in England, but the public of that country, pending a general improvement in mining morality, and in results, should, in the meantime, carefully abstain from putting its money into new West Australian ventures.

The good mines.

To summarise the position generally there are ten good mines. These are :—

Associated.
Lake View.
Great Boulder.
Golden Horseshoe.
Ivanhoe.

Kalgurli.
Great Boulder Perseverance.
Hannan's Brownhill.
Lady Shenton.
Sons of Gwalia.

Of these, those in the first column are probably better than those in the second column, but all, as far as is now known, are genuinely good. These mines should contribute about 75,000 ozs. to the monthly output for years to come.

Second-class mines.

The list of second-class speculative mines is as follows :—

At Coolgardie :—

Burbank's Birthday.
Vale of Coolgardie.

Westralia and E. Extension.
Lady Charlotte.

At Kalgoorlie :—

On ore values :

Great Boulder Main Reef.
Brownhill Central.
North Kalgurli.
South Kalgurli.
Hainault.

Hannan's Star.
Brookman's Boulder.
Golden Pike.
Kalgoorlie Mint and Iron King.

Speculative investments.

On good location :

Chaffers.
Brownhill Extended.
Golden Link.
Hannan's Oroya.
Lake View South.
Central Boulder.

At Menzies :—

Queensland Menzies.
Menzies Alpha.
Florence.
Menzies Gold Reefs.
Menzies Mining and Exploration.
Menzies Gold Developments.
London and Coolgardie Explorers.

Broad Arrow :—

Hill End.
Paddington Consols.

Norseman :—

Norseman Mines.
Princess Royal.

Murchison :—

Peak Hill.
East Murchison United

Everything else in the colony seems to be unworthy of the attention of even the boldest and most hardened speculator.

CHAPTER VI.

THE GOLD MINES OF QUEENSLAND.

Introductory.

THE colony of Queensland takes rank as one of the important gold-producing countries of the world, and, to my mind, offers better chances in new gold-mining undertakings than any other colony of Great Britain.

The principal mineral belt, lying on the eastern side of the colony's immense area, extends for 800 miles in length, and 200 miles in breadth. This belt, all undeveloped as it is, already ranks as one of the great mineral areas of the world; it contains gold, silver, copper, lead, tin, iron, manganese and coal; but gold forms by far the most important product of all, and already the colony has produced over 13,000,000 ozs. in a steadily increasing progression.

The chief gold-mining centres which already exist are:—Gympie, Mount Morgan, Ravenswood, Charters Towers, Etheridge, and Croydon. In these neighbourhoods active mining and a fair amount of prospecting have been carried on for a number of years, but beyond such localities the whole of the immense area is undeveloped, unprospected, and almost unknown. For a thousand miles a forest of gum trees covers the country: kangaroos still find a sanctuary in its depths; from the upper branches king parrots look down in wonder on a passing Chinaman prospecting the dried-up river beds; once a year, perhaps, a white "fossicker" appears and sets up his camp for a few days beside the nearest water hole. The "fossicker" is truly at home in the Queensland bush; many a time have I, riding through the forest, come upon such

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NOTE B.—The Queensland mines were visited in June and July, 1898.

an one busily at work in the noon-day heat, cheerfully wielding his pick or patiently turning the windlass which stands above his little shaft.

> "A stout old sinner, and a stark, as ever
> Blue swag has carried through
> That grim wild land men name the Never-Never,
> Beyond the far Barcoo."

There is a great work for the "fossicker" in these solitudes for many years to come, and for the sake of the future of gold-mining in Queensland it is well that there is no fear of the type becoming extinct.

But while the tropical sun continues to beat down upon the hundreds of "fossickers," working singly or in pairs throughout this great mineral belt, or upon the busy mining throngs in such flourishing centres as Charters Towers or Gympie, I proceed to a more precise, if less poetic, discussion of facts and realities.

Total yield to date.

Reef gold was discovered in Queensland in 1867, and up to the present time the total yield, as already stated, has exceeded 13,000,000 ozs. Recent figures are :—

Year.	No. of ozs.	Value.	Value per oz.	
		£	s.	d.
1897	807,928	2,553,141	63	2

The low value of the bullion is owing, firstly, to the fact that much of it contains an unusually large proportion of silver; secondly, that a large amount of cyanide gold, worth only from 25s. to 30s. per oz., is returned, with the consent of the Mining Department, as ordinary bullion. As a matter of fact, the fault lies at the door of the Government, which, in its anxiety to bring Queensland out at the head of the Australasian Colonies in the yearly output of ounces of gold, instead of sterling, has allowed the returns to be made up in this specious manner. This is rather a childish proceeding for a Government, especially for that of the colony of Queensland, which I feel persuaded in its undeveloped mineral resources far surpasses any other colony of Australasia.

Yield per ton

To gain a correct idea of the value of Queensland ores, I subjoin the returns, for 1897, from the six principal districts of the colony. These show as follows:—

NAME.	TONS TREATED.	YIELD PER TON.	
		s.	d.
Charters Towers	198,873	103	7
Mount Morgan	129,227	109	10
Gympie	65,106	102	9
Croydon	42,162	68	11
Ravenswood	20,510	60	10
Etheridge	16,537	75	3

This shows a high yield per ton, but in every case, except the individual yield of Mount Morgan, a comparatively small tonnage treated. In other words, the rich ore, which can be easily distinguished by the mineral which it carries, has to be carefully mined and sorted from a frequently narrow and varying lode.

Exploratory work needed

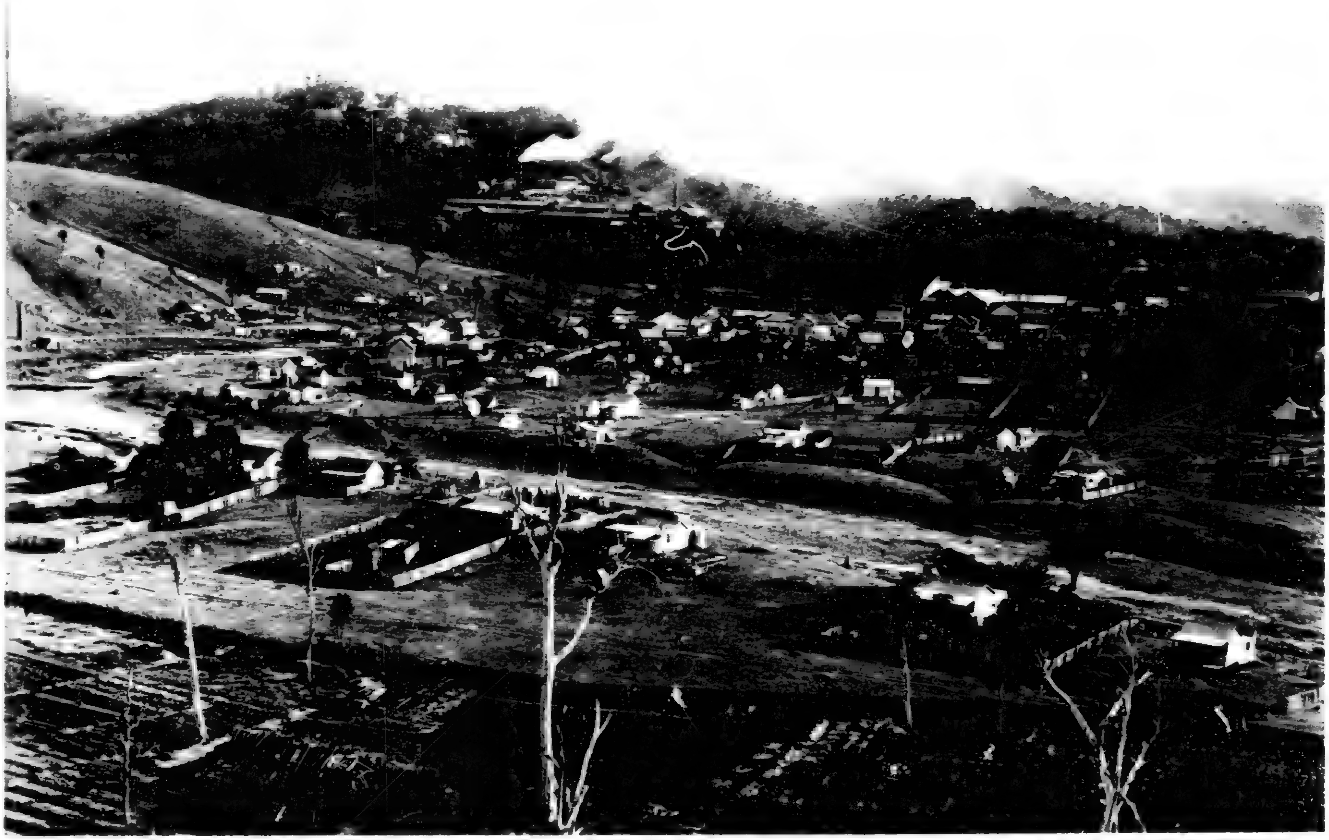
Before proceeding to describe the various districts of Queensland in detail, I must set on record the statement that I consider the immense undeveloped gold resources of the colony offer a distinctly attractive field for the operations of explorers; prospecting expeditions, equipped with a working manager, a capable sampler and assayer, and a sum of, say, £10,000, all of which could be available for genuine exploration work, are much needed all over Queensland. Such undertakings, whatever their ultimate results, would be justifiable speculations, and may safely be recommended to the consideration of English capital.

The well-known centres are already entirely in the hands of the colonists who, as a whole, have shown great energy in mining, and have reaped large benefits. But they are conservative; they are satisfied with Charters Towers and Gympie and Croydon, leaving the remaining immense areas of this gold belt, with all its undeveloped resources, untouched. This is where English capital has its chance at present, and, provided only that the suggested exploratory undertakings are honestly worked, success, in the aggregate, should be the result.

During my stay in Queensland, besides visiting about forty mines in different parts of the colony, I spent days together in the bush, sampling the huge dyke formations and outlying reefs in the districts of Ravenswood and Charters Towers. All these dyke formations, which were always several hundred feet thick and could be traced for miles, invariably averaged at least 4 dwts. fine gold to the ton. Several of the reefs, in the hands of "fossickers," gave distinctly promising assays, and it is safe to say that the judicious spending of moderate sums of money in these districts would unearth a number of really payable mines. A sufficient amount of water is generally procurable, and the railway from Townsville to Ravenswood and Charters Towers passes within thirty miles of most of the prospectors' camps.

The good mines are controlled locally.

The press in Queensland, and many of the individual colonists engaged in mining, are always clamouring for the introduction of English capital to develop the latent resources of the country; knowing themselves how genuinely great these resources are, they cannot understand why English investors continue to keep away. The explanation is simple: any good mine discovered in the colony will be at once financed by the local mining men, who, to do them justice, have a sound judgment in such matters, but any bad or doubtful mine is immediately handed over to some agent, with instructions to float the same in England, if possible. In this manner the English public has been induced to buy about twenty mines, none of which had been proved to be payable, and, of course, all of these have now come to grief. This especially applies to Charters Towers, where all the worst located ground appears to be held by



MOUNT MORGAN.

English companies, and all the best by local owners, and it is somewhat amusing to hear the prosperous mining men there refer to the bad judgment and failure invariably associated with an English floated mine. The most engaging liars of the community, knowing how the English *judgment* was played upon, could probably tell a different tale.

But this unpleasant side of the case must not be too strongly accentuated. Many people in England have done excellently well in Queensland shares, and will again do well; the author himself is in receipt of a substantial cheque once every month from Charters Towers, and, with the exercise of reasonable caution, many of the failures of the past may be redeemed by new enterprises.

We will now discuss in detail the different mining districts in Queensland where gold forms the principal source of value.

Gympie.

Gympie lies about 100 miles north of Brisbane, and 25 miles from the coast. It may be considered as almost the most southerly point of the great mineral belt. The first discovery of gold here was made in 1867, and ever since, the district has ranked as a flourishing quartz mining centre. Now the town of Gympie, beautifully situated on wooded slopes, supports a population of 15,000 persons, almost all of whom are directly interested in gold mining.

Many of the older mines at Gympie, after prosperous careers, are now worked out, but others have come into existence. At the present time there are probably nearly 100 mines on this field, but of these only a comparatively small number are really worth noticing in detail.

Gympie has now produced over 2,400,000 ozs. of gold. The mines are, and have always been, almost entirely financed and developed by local companies; economy has always been a noticeable feature of the management, though occasionally carried to excess; careful supervision from the directors, who live on the spot, and who are all practical men, has always been in force, and, on the whole, the aggregate results from the commencement have been exceedingly favourable. As may well be imagined, any well-located ground at Gympie is always quickly acquired by local syndicates, and the one or two properties that have found their way on to the London market have had nothing to recommend them. Gympie is, in fact, almost unknown to English investors.

In 1897 the twelve principal producing mines crushed altogether 44,116 tons for a yield of 74,378 ozs., worth about £240,000, and from this, dividends of £150,910 were paid. Of this amount, probably not 3 per cent. reached England. These figures show that a good deal of sound and honest work is got through at Gympie, and the aggregate results, to my mind, compare favourably with any gold field I have ever visited.

Geology of Gympie.

The occurrence of gold on the Gympie field is most peculiar. Several parallel beds of slate, dipping at about 20 degrees, traverse the country; the thickest of these beds is about 200 feet, and the others are frequently not more than 10 feet thick. In the opposite direction, dipping at a much deeper angle, is a series of strong, well-defined, white quartz reefs. These reefs are valueless except when they cut through the slate beds, but, at those particular spots, they invariably carry gold which is frequently highly payable, and is usually found in a nuggety state. So common a feature indeed, is visible gold at Gympie, that each mine is provided, underground, with a strong box, which from time to time becomes filled with "specimen" stones, taken from the contact of the slate, where it is blackest, and the reef, and worth several hundred ounces.

To prove the continuance of gold in depth at Gympie, therefore, one follows not the reef, but the main band of slate. When the first reef is reached it will furnish reserves of ore for 200 feet in height, that is to say, for the whole distance in which it is found in contact with the slate band. When this is worked out, a cross-cut is put through the slate to tap the next reef of the series which, in its turn, will also produce the looked for 200 feet, of good value, and so on. Several of the best located mines have proceeded to work out four or five reefs in this manner, and are still, after long and successful careers, making good profits.

Gympie deep levels.

Within the last two years, at Gympie, the deep level area of the field has been largely developed, and with notable promise of success. As the slate bands, dipping at 20 degrees or so, reached a depth of from 800 to 1,500 feet, it was found that they encountered a new series of reefs, which, valueless elsewhere, as was the earlier series, frequently carried rich gold at the contact of reef with slate. The success of these deep level mines has quite revived the fortunes of the Gympie field, and it is in this class of mine, selected judiciously, that English capital may be laid out as a promising and justifiable speculation.

A personal inspection was made, underground, of twelve mines at Gympie, most of which were deep levels. The opinion formed was decidedly favourable as to their prospects, and also in regard to the prospects of a number more in adjacent localities. It is the writer's opinion that there is no doubt but that most of the deep level mines, and some of the older series, which are not yet worked out, some twenty or thirty in all, will do really well within the next few years, and will pay in dividends greater sums than those at which they are now capitalised. This opinion is shared by a number of mining men in the colonies, and at the present time the Gympie field is attracting the attention of capitalists from all parts of Queensland and New South Wales.

Gympie and West Australia compared.

It is interesting to compare the chances of twenty or thirty of these mines, with their moderate capitals, economical management, and, in cases, their already proved value, with the prospects of 100 or 200 West Australian wild cats—over-capitalised, their cash squandered, and their chances less than nothing; and yet the Gympie mines are practically unknown in England, while there are plenty of papers prepared to make excuses for the dishonest existence of the others.

Method of capitalisation.

A Gympie mine usually has an area of 25 acres, and a capital of not more than £24,000, divided into 5s. or 10s. shares. The vendors' interest is in many cases almost non-existent. As the opening up of the mine proceeds calls are made on the shares from time to time, but the producing stage has usually been reached when only one-half or two-thirds of the liability on the shares has been called up. This leaves the shares, even of regular dividend paying mines, with a liability of several shillings, which English investors object to. To add to this drawback is the fact that none of the Gympie mines have London offices. Transfers of stock cannot be effected in England, and should a call be made on unpaid shares, the holder at a distance who does not receive adequate warning is liable to have his shares forfeited. These drawbacks, firstly, the fact that the shares are usually only partly paid; secondly, that there is no London office where calls may be paid and stock transferred, should be brought to the notice of mining companies in Gympie. A central London transfer office should be established, where also all information from the field, showing the progress of each mine, could be secured. The result would certainly be a notable increase in the buying and selling of Gympie shares, which would much benefit that field, and, indirectly the whole Queensland gold industry.

Scottish Gympie Mines, Ltd.

Several Gympie mines have recently been floated in Glasgow. The best of these is the **Scottish Gympie Mines, Ltd.,** with a capital of £15,000. This, at the time of my visit, was the deepest mine on the field, the slate coming in contact with the reefs at about 1,400 feet. The several reefs aggregated a great width, 20 to 30 feet, I should imagine. A great deal of this ore is worth 10 dwts. to the ton, at which figure a handsome profit can be made, and although not enough work had been done to speak decisively of the future, the chances are that it will be really successful. The company is erecting its own battery, an unusual feature at Gympie, where customs' batteries have previously been employed, but as the mine can be worked on a large scale, the course pursued is the correct one.

The best mine at Gympie, at the time of my visit, was the **No. 2 South Great Eastern,** with a lot of rich ore in sight. The immediate prospects of the **North Smithfield, No. 1 North Oriental and Glanmire,** and **No. 2 Great Eastern** seemed very favourable.

Promising Gympie mines.

As the result of my inspection, I made out a list of twenty of the most promising mines of the district; these are divided into two classes, producing and speculative, but the merits of all are in the aggregate of a sound nature :—

A. PRODUCING.

Columbia and Smithfield
North Smithfield
No. 1 North Smithfield
Smithfield and Phœnix Golden Pile
Phœnix Golden Pile
Scottish Gympie Mines
No. 2 Great Eastern
No. 2 South Great Eastern
Oriental and Glanmire
No. 1 North Oriental & Glanmire

B. SPECULATIVE.

No. 1 North Columbia and Smithfield
No. 3 North Smithfield
No. 4 North Phœnix
No. 1 South Great Eastern
South Glanmire and Monkland
North Oriental & Glanmire
No. 1 South Oriental & Glanmire
No. 2 North Oriental & Glanmire
No. 3 North Oriental & Glanmire
Columbia Consolidated

Doubtless since this list was drawn up changes have taken place on the field, and some of the mines classed as speculative may now be regular producers with ore in sight. On the whole, however, the twenty mines still probably form the best list of mines on the Gympie field, and judicious speculation in these should eventually prove remunerative.

Mount Morgan.

The celebrated **Mount Morgan** gold mine is situated about twenty miles east of the port of Rockhampton, Central Queensland, and is now connected with that town by railway. The mine was discovered in 1882, and for several years was worked on a small scale by a private syndicate. Its great richness led to its flotation, in 1886, as a public company, with a capital of £1,000,000 in £1 shares, all of which have 17s. 6d. paid up. Owing to the excessive richness of the ore, which about this time was quarried from the top of the mountain, the returns were much higher than they have ever been since. In 1889 dividends of £1,100,000 were paid, and about this period the shares touched the extreme price of £17 : 5 : 0. When it was found that the very rich ore was of limited area, a big reaction naturally set in, and by 1892 the shares had fallen to £1 : 10 : 0. This low figure of valuation was not warranted, as development had already proved the existence of immense bodies of ore of a lower but nevertheless highly payable grade, and a gradual appreciation in price, based on the intrinsic value of the mine, has since then again taken place.

The most wonderful gold mine in the world.

Mount Morgan is, without doubt, the most wonderful gold mine yet discovered in the world. The Mount itself forms one of a chain of hills, all thickly clad with bush, which, consisting as it does of stunted gum trees, covers the greater part of the Queensland gold belt. Fifteen years ago the place was a solitude, now the valley below contains a flourishing town: the sides of the hill are covered with acres of the most perfect machinery: and the whole top of the Mount has already been quarried away. Over this scene hangs an almost perpetual cloud of smoke, rising up from the numerous furnaces, and at night the Mount resembles a huge volcano belching forth smoke and flames from a hundred fissures. Those who read this must not imagine that Mount Morgan is a hill of solid gold-bearing rock, but, as a matter of fact, probably two-thirds of the whole hill *is* gold bearing. All the top of the hill, equal in area to about 250 yards long, 200 wide, and 100 deep, has been, or will be, quarried away almost entirely. Below this the sides of the hill spread out and form an outer shell of non-gold bearing rock, down the centre of which the great patch of gold ore continues. Several shafts have been sunk down into the heart of the hill, and here and there, from them, exploratory drives have been put in. These casual explorations do not go far to determine the value of the mountain, but they have proved, without a doubt, that at the lowest point reached, viz., 650 feet from the original top of the mountain, the great deposit of gold-bearing ore has hardly become any smaller than at the top of the hill, nor are the average gold contents less than they have been at any other point—always excepting the original summit of the Mount.

Has perfect machinery.

Mount Morgan is not only the most wonderful gold mine, but it can now boast, I think, of having the most perfect gold extracting equipment ever erected. For several years after the discovery of the mine, every known method of gold extraction was tried on the ore without real success. The particles of gold are so exceedingly small, and are so often coated with chemical substances, that the simpler methods of recovery were found to be quite useless. Eventually it was found that dry crushing followed by chlorination was a complete success, that is to say, it effected an extraction of from 94 to 98 per cent. of the gold, and this process was definitely adopted. The wonderful feature about the Mount Morgan plant of to-day is the perfection to which the originally clumsy and costly chlorination process has been reduced; the combination of extreme cheapness of treatment with complete efficiency of extraction.

Before describing this wonderful plant it is necessary that I should deal with the problem which the immense body of proved gold-bearing ore and its value presented, we will say, two years ago, to the management.

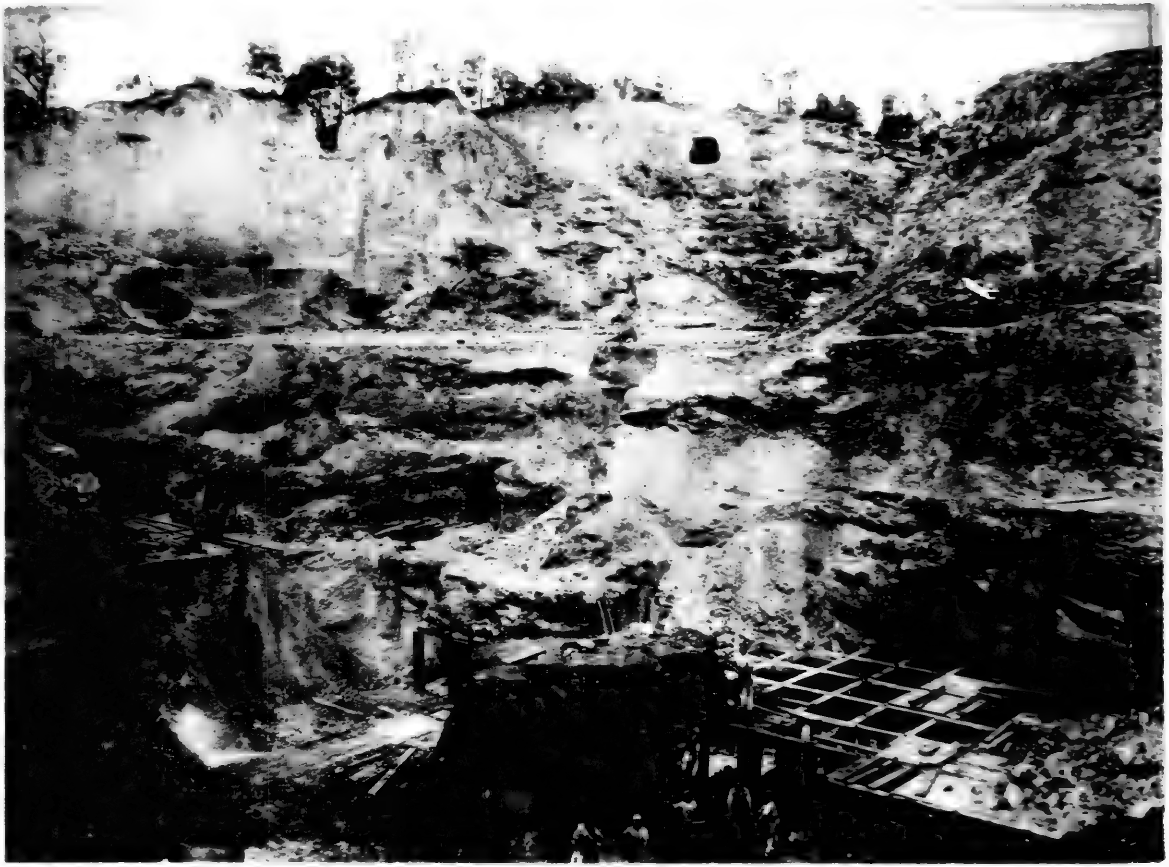
An immense low-grade mine.

Firstly: the cardinal fact to be remembered in connection with Mount Morgan is that it is now an immense low-grade mine. There is no doubt that the ore at the top of the hill was very much richer than the average; this, large patch though it was, has now been practically worked out. For five hundred feet below this, down into the heart of the mountain, the ore body is proved to continue, and although showing no diminution in size, the really rich chutes, that is to say, with ore carrying over one oz. to the ton, are of limited area. To keep up the output these chutes, too, have, of recent years, been tapped rather too freely, so that it became evident that if the yield was to be kept up in the future the tonnage treated would have to be largely increased. In connection with this the management knew that the supply of low-grade ore, that is to say, of ore assaying from 5 to 10 dwts., was practically inexhaustible, while there was also a large amount of medium grade ore worth about 10 to 20 dwts. proved. Another point for the consideration of the management was the fact that it was now necessary to erect a large and specially adapted plant for the treatment of sulphide or mundic ore which formed the bulk of the ore reserves, and which under ordinary circumstances is a much more costly sort of ore to treat than the oxidised ore from the treatment of which dividends had previously been paid. With these facts in view the Company's metallurgical engineer designed and erected a new plant for the dry crushing and chlorination of 100,000 tons of low grade oxidised ore a year, and, starting this in sections, the whole plant was in working order early in 1898. At the same time designs for a plant to treat a similar quantity of sulphide or mundic ore were made out, and at the time of my visit [NOTE B] the first section of this plant was well under way. Now I come to the extraordinary success which the first of these plants has achieved. There is not the slightest doubt but that the treatment of sulphide ore will be equally successful, and that in the year 1901, Mount Morgan, on a low grade basis, will be a greater and more profitable mine than it ever was, with the certainty, too, of an unlimited life before it by treating ore which previously was considered quite unpayable. At the time of my visit the new plant was treating 10,000 tons a month of oxidised ore at the following costs :—

Working costs at Mount Morgan.

	PER	TON.
	s.	d.
Quarrying and hauling	2	0
Breaking, drying, and crushing ...	2	5
Roasting	3	0
Chlorination and discharging vats...	3	6
General	1	7
Total	12	6

If I add 2s. 6d. for head office expenses, dividend tax, and Government royalty, we get a total cost of 15s. per ton, or about 4 dwts. of Mount Morgan gold as the cost of treatment of over one half of its total output. The recovery value of the oxidised ore being treated by this plant was 7·7 dwts. a ton, the extraction being 95 %, and this yielded a clear profit of 14s. per ton. I may add that there are millions of tons of oxidised ore in sight that will average this value.



J. H. Lundager, Photo.

MOUNT MORGAN—OPEN WORKINGS.

The total cost for treating sulphide ore, when the full plant is completed, should be about 23s. per ton, so that, assuming an equal quantity of each class of ore is treated, the average cost will be only 19s. per ton all told. Let these figures for the year 1901 be compared with the costs for 1897 and 1898, with the old types of machinery at work, and the wonderful perfection of the Mount Morgan plant will become evident.

COST OF TREATMENT—MOUNT MORGAN.

	1897.	1898.	1901 (estimated).
Tons treated	110,462	153,297	240,000
Ozs. gold	159,817	172,029	156,000
Value of yield	£656,780	£697,189	£624,000
Value per ton	£5 : 9 : 10	£4 : 1 : 0½	£2 : 10 : 0
Total costs per ton... ...	£2 : 9 : 0	£1 : 15 : 6½	£0 : 19 : 0
Profit per ton	£3 : 0 : 10	£2 : 5 : 6	£1 : 11 : 0
Total profit...	£386,676	£367,874	£396,000
Dividend paid	£300,000	£300,000	£350,000
,, per share per month	6d.	6d.	7d.

Future of Mount Morgan.

About the future of this great mine I believe that it is possible to speak very definitely. From a calculation of ore in sight, I consider that there are already exposed reserves to last for the next twenty years, reckoning on the increased tonnage to be treated from 1901. As I have before stated, the deepest workings in the Mount show that there is apparently no diminution in either the size or the value of the gold-bearing rock, and I am quite convinced that it will be merely a matter of shaft sinking and driving to open up another twenty years' reserves; probably even then the mine will be only partially exploited.

Dividends.

So much for the permanence of the mine. With regard to dividends I feel sure that there is equal security for the future. In the past the dividends have been as follow:—

Year.	Rate per cent.	Amount paid.
		£
1886	3·3	33,333 ⅓
1887	25	250,000
1888	27·5	275,000
1889	110	1,100,000
1890	70	700,000
1891	39·1	391,666 ⅔
1892	30	300,000
1893	30	300,000
1894	30	300,000
1895	30	300,000
1896	30	300,000
1897	30	300,000
1898	32·9	329,166 ⅔
	487·8	£4,879,166 ⅔

Bulk of shares held by the directors.

It is a noteworthy fact about the Mount Morgan Company, that quite three-fourths of the shares are held by the directors and their friends; this being the case it has been the aim of the directorate, especially since the reaction caused by the early rich crushings, to place the mine on a thoroughly sound financial basis. In this it has succeeded. From 1892 till [illegible]98 the dividend was 6d. per share per month without variation; during that period an entirely new plant was erected and paid for out of profits, and a reserve fund of £135,000 was accumulated. In June, 1898, a dividend of 7d. per share, equal to 35 % a year, was commenced, and there is little doubt but that this will be maintained.

Summary (Mount Morgan).

To briefly sum up the facts about Mount Morgan, I would advise investors to take note of the following points:—

The mine must be judged in the future as being able to produce an almost unlimited quantity of ore worth 50s. per ton, and this, thanks to the great perfection of its plant, will soon only cost 19s. per ton to treat. On a probable treatment, from 1901 onwards, of 240,000 tons a year, it should be a matter of no difficulty to continue the payment of a monthly dividend of 7d. per share, or 35 °/ₒ per annum. There is no reason to think that the mine will not last for the next fifty years.

There are dozens of hills near Mount Morgan entirely similar in outward appearance, but, although these have been prospected over and over again, no gold-bearing deposit of a payable value has been discovered. At some little distance away is the Mount Usher mine, which from time to time turns out a little gold—but never with payable results.

As to the origin of the Mount Morgan deposit no two geological authorities appear to agree. I read four reports on the subject, and each one expounded an entirely different theory. Most probably the occurrence of the gold was due to a thermal spring, or geyser; but what was the method of precipitation? or why is it that there is only one such deposit, and that of such extraordinary value? are questions not likely to be easily solved. This great mine with its perfect machinery ranks still as the most wonderful individual gold mine in the world, and will long continue to do so.

Ravenswood district.

The next gold-mining centre as we go northwards is the **Ravenswood** field. Ravenswood has been a gold field since about 1870; it was by Ravenswood prospectors, indeed, that Charters Towers, 50 miles distant, was discovered.

There are no prosperous mines in the Ravenswood district. A few are working in a small way and make occasionally a little profit; others are leased to parties of tributors who just manage to make a living; but most of the earlier known mines are shut down, and a number of known reefs have lain for years unexploited. In 1897 the field produced £62,432 in gold from 20,510 tons, or an average of £3 : 0 : 10 per ton.

The failure of Ravenswood is not due entirely to a lack of gold. In the immediate vicinity of the village there are a number

Ravenswood reefs rich, but refractory.

of reefs which carry gold, silver, and other minerals. These reefs are in places undoubtedly rich; but they are narrow, often badly faulted, and the ore is exceedingly refractory, necessitating smelting. Some years ago a Scotch company essayed to erect a smelter here, but after gross mismanagement, and the spending of a very large amount, the company, even before completing the erection of the plant, went into liquidation. As it is, it does not pay to ship ore from Ravenswood to distant smelters unless it assays £6 per ton, and to attain this grade the ore has to be so carefully picked that there is practically no profit remaining. With good smelting facilities the reefs round Ravenswood should become payable—though on a small scale.

Outside the area of refractory ore there are a few mines at work. Several which I visited were in the hands of parties of tributors, but one or two are also being worked by English companies.

Hadleigh Castle.

The **Hadleigh Castle** mine, an English flotation, has an issued capital of £150,000 in £1 shares; 20 stamps were crushing 700 tons a month, the sands being afterwards cyanided. The yield was about 11 dwts., and the monthly profit £400. The ore chute was apparently about 300 feet long, and the reef three feet thick. On this the incline shaft was sunk to 650 feet with fairly good ore showing in the bottom. It is possible that exploration work will expose another reef; but on the one reef only, considering the limited area of payable ore, and its low value, the mine does not promise to become a really profitable one.

John Bull.

The **John Bull** mine (English) has an issued capital of 140,000 10s. shares. A new shaft was being sunk to drain the old workings which had become full of water. Evidently all the payable ore in sight had previously been worked out, but from indications in the lowest workings, before they became flooded, it was expected that the new shaft would tap a body of payable ore. In any case the ore is very low grade, and even after considerable expenditure in new development only small and uncertain profits can be looked for.

The Ravenswood district is well worth an inspection by representatives of prospecting or exploration syndicates and companies. Such an inspection should include a careful survey of the huge dyke formations and gold-bearing lodes referred to previously, which lie in the bush at different localities in the district, but which are all within a day's ride from the railway.

Charters Towers.

Charters Towers is the most important mining centre in Queensland, and with the exception of Kalgoorlie (Western Australia), the most important in Australasia. It lies eighty miles inland from the port of Townsville, with which it is connected by rail, and 800 miles north of Brisbane. The field was discovered in 1871, and since then has gone on steadily progressing in importance. It now supports a town of 23,000 inhabitants, and has a monthly output of 40,000 ozs. of gold. In 1897 it produced gold worth £1,030,671, with dividends of £340,244.

Nature of the ore.

The reefs, of which there are a great number, lie within an area of several square miles. They are fissure veins of whiteish quartz, lying in solid granite, and where richest, carry large quantities of galena and pyrites. The reefs are free milling, and amenable to cyanide; concentrates are collected and treated locally by chlorination, for which process there are several customs plants. The lodes carry more or less defined chutes of rich ore, but on the whole they are irregular in their occurrence and in their values. Generally speaking, calculations of the value of Charters Towers mines are only safe when they deal with ore actually in sight, and all estimates as to the lives of the mines or their probable dividends, except from ore developed, are more or less guesswork. Fortunately, most of the best mines have a good deal of ore in sight, and estimates of the lives and profits of such mines as the Brilliant, Brilliant St. George, Victoria, Day Dawn Block and Wyndham, and Band of Hope can be made with considerable safety.

There are probably 100 mines in existence within a radius of three miles of Charters Towers, but the great majority of these are quite unimportant, entirely controlled locally, and need not be noticed in detail.

Reefs worked.

The principal lines of reef now being worked, and in which English capital is sunk to a considerable extent, are the **"Brilliant," "Day Dawn," "Victoria," "Queen," and "Victory"** reefs. Apparently the **"Brilliant"** and **"Day Dawn"** reefs lie deepest in the series, and as they are also by far the largest and richest now being worked, the future of Charters Towers may be said to largely depend upon their productiveness.

Neither of these principal reefs appears to have any great lateral extent, and as they are being worked out by not only the outcrop mines, but by several rows of deep levels simultaneously, they are rapidly becoming exhausted.

Charters Towers town and people.

Charters Towers is a flourishing town. In no town of its size in the whole world, probably, are there so many working men, miners, foremen, and such like, who are worth at least £1,000 each, either in cash or in property, as here. Nearly all the dividends from the mines are distributed locally, and there is always ample capital forthcoming, locally, for any really promising mining venture.

Speaking generally, mining at Charters Towers is conducted with soundness and honesty. The Charters Towers miner, for example, is a better man than the New Zealand miner, and the financial conduct of affairs is a long way superior to Western Australia. But there are many faults to be criticised. The local capitalists have the entire control of the mines, and, not infrequently, have used this control, although standing in the fiduciary position of directors, to their own advantage. Taking the actual mining, it may be said to be well and economically performed. After the ore is raised to the surface, however, its handling is by no means so judicious. To begin with, few of the mines possess ore bins; the ore is therefore tipped on to the ground, whence it has to be shovelled into carts at an extra and totally unnecessary cost of quite 1s. per ton. It is then carted—not to the company's own mill, for few of the mines own a reduction plant—but to a customs mill where it is crushed and roughly concentrated at a cost of 13s. or

Defective reduction methods.

14s. per ton. These customs mills usually belong to the local capitalists, who are also directors of the various mines, and it is not to be wondered at that they, in their capacity of directors, never protest against the extortionate charges for milling the ore, which, in their other capacity of mill owners, go into their own pockets. This abuse has always been a flagrant one at Charters Towers, and there are many mines with years and years of ore in sight which have rather preferred to go on paying 14s. per ton for milling, than to put up their own battery, which would have paid for itself in a couple of years. Not satisfied with charging 14s. per ton for milling, the battery owners insisted, until quite recently, on keeping the tailings also, from which they have made large profits. Now, the mining companies are allowed to remove their tailings, but all this additional handling comes as a severe tax on working costs, and is greatly to the discredit of the various boards of directors.

Local mining abuses.

Recently, in connection with this system, a curious fact came to light. The Brilliant (P.C.) mine had been at work for ten years; during that time it had crushed 250,000 tons of ore, but had never had its own battery, and had paid 14s. per ton, or about £100,000 more than if it had had its own mill, for getting its ore crushed. The principal proprietor of the battery was the managing director of the Brilliant (P.C.) mine. Owing, at last, to unpleasantness on the board, he resigned, and at once brought an action against the Brilliant (P.C.) mine for possession of the valuable tailings, which he, in his capacity of managing director, had allowed, in his capacity of mill owner, to accumulate on his battery site.

This is only one case out of many.

It is not even now too late for many of the smaller producing mines at Charters Towers to band together to buy batteries. It is an ascertained fact that 7s. per ton would cover all costs of milling, if the mine owned its battery, as against 14s. at present paid, while the re-handling of concentrates and tailings would be largely done away with.

In other departments, except the actual handling of the ore, Charters Towers mines are well run. General expenses, secretarial and directors' fees, are extremely moderate, and the finance of the companies is usually well conducted.

The unfavourable features referred to appear to afford no anxiety to local shareholders, who are educated to expect early dividends at the sacrifice of all expenditure on capital account or machinery, and as for the local press it is painfully non-critical. It really rests, therefore, with English shareholders to protest against these abuses.

Worthless English-owned mines.

From time to time, whenever the state of the money market admitted of it, the English public has been saddled with a series of Charters Towers mines which local speculators had refused to take up, or which they had practically worked out. Among these are such names as the Mosman Gold Mines, Lady Carrington, Golden Gate, New Charters Towers, Charters Towers Consolidated, Columbia, Peabody and Berkshire Rainbow and Peabody, and Towers Hill. All these mines are failures, as was to be expected from their localities, and it is almost surprising that Charters Towers, good field as it is, is not looked upon with more suspicion by English investors than is actually the case. Its reputation is, however, saved by the regular dividends from such mines as the Brilliant, Brilliant St. George, Day Dawn and Wyndham, Victoria and Victory, of which mines a number of shares are held in England.

Old tailings.

Within the last year or two, about seventy small cyanide plants have been erected near Charters Towers to work the old tailings, which for years had been allowed to run to waste, and which have filled the river beds for miles. Returns from these have helped to raise the monthly output from the field to about 40,000 ozs., but I am strongly of opinion that at about this figure the maximum of production has been reached, and after a short time a gradual falling off will be noticeable. Several years more of profitable results may be expected from the "Brilliant," "Day Dawn," and "Victoria" lines of reef, but after that several of the now best-producing mines will have been worked out, and I see no new mines likely to take their places. On the whole, Charters Towers may now be considered at its zenith, and it contains six or eight mines which still form tempting investments.

"Brilliant" reef.

The "Brilliant" line of reef, or rather the one payable chute on that reef, is now the most valuable lode at Charters Towers.

This chute was never found near the surface, but was first worked in the Victory mine at a depth of 300 feet. From there it passed into the Brilliant (P.C.), the deep level of the Victory; then into the Brilliant St. George, the deep level of the Brilliant; a small area was found, too, in the Brilliant Extended, the deep level of the St. George, at a vertical depth of about 2,000 feet. These are the mines that contained the main run of the chute, but fringes of rich ore were also found in the East Mexican, Brilliant Freeholds, Brilliant Block, and Phœbe, and quite a large area in Kelly's Queen Block. The only mine on the "Brilliant" line which has not found a portion of the chute in its area is the Brilliant Deep Levels, the shaft of which cut the reef at 2,240 feet, but quite out of the line of chute ore, and although a lot of development has been done in that mine, no payable ore has been found.

"Brilliant" reef profits.

The "Brilliant" reef which was discovered by accident about twelve years ago, has yielded from this rich chute very fine profits. Up to the end of 1898 the dividends paid from "Brilliant" ore were, approximately, as follow:—

NAME.	DIVIDEND.
Victory	£175,000
Brilliant (P.C.)	520,000
Brilliant St. George	310,000
Brilliant Block	73,000
Kelly's Queen ... (say)	22,000
	£1,100,000

It is safe to say that during the next few years this total will be largely increased by dividends from the Brilliant (P.C.), Brilliant St. George, and Kelly's Queen.

Continuation of "Brilliant" chute in depth.

It is a curious fact that up to the time of writing this, the continuation of the Brilliant chute in depth, after it leaves the St. George and Kelly's Queen, is problematical. A small fringe of rich ore was found in the Brilliant Extended, but this has been worked out, and drives put in along the reef, in the direction in which the chute might reasonably be expected, while opening up immense bodies of ore, have failed to find anything payable. In the Brilliant Central, again, through which part of the chute area should certainly run, no payable ore has been found. It seems incredible that a strongly-defined chute such as this should live down to 2,000 feet, and then suddenly cease to exist. Certainly the reef itself continues, and the granite formation is wonderfully regular; this being the case, it seems almost a certainty that the chute will again be picked up. The Brilliant Central mine is the best located in this respect, and it will probably be within *its* area that the lost chute will be rediscovered.

I will now deal with the mines of the "Brilliant" reef in detail.

Victory mine.

The **Victory** mine has a capital of 200,000 5s. shares, of which 160,000 have an unpaid liability of 1s. 2d. In this mine the "Brilliant" reef has now been worked out. The future of the mine depends upon results from the "Victoria" reef, which is now being worked. It is probable that a large area of this reef will be found payable, and that present results will be kept up for several years to come. The mine pays every year several dividends of 6d. a share, and, as the shares stand at not more than 8s., they may be considered a fairly good purchase.

East Mexican.

East Mexican.—All the payable ore in this mine is worked out, and the shares consequently are not worth buying.

Brilliant Freeholds.

Brilliant Freeholds.—This is one of the mines which only contained a fringe of the "Brilliant" chute, which has now been worked out, and although a good deal of exploratory work has since been done, no more payable ore has been found. The company has cash resources in the shape of partly paid shares, and will doubtless continue its explorations, but the chances are that nothing of value will be discovered, and the shares are not therefore a good speculation.

Brilliant (P.C.)

Brilliant (P.C.).—Capital, 260,000 £2 shares, fully paid. As has already been stated, this mine, from the treatment of about 240,000 tons of ore, paid in dividends, up to the end of 1898, about £520,000. The mine has now been developed to all its boundaries, exposing all the ore that is likely to be met with. At the time of my visit [Note B], I estimated that there were 100,000 tons of good ore still remaining in the mine. This would take four years to crush, and would produce 24s. a share profit. A dividend of 6d. per share a month is regularly paid, and as the mine will have assets of value on hand when it is worked out, and possibly more ore in it than has been allowed for, the shares at 12s. or so may still be considered quite a sound and justifiable purchase.

Brilliant Block.

Brilliant Block.—Capital, 100,000 £1 shares, of which 30,000 have 6s. uncalled liability. This company only possessed a fringe of the "Brilliant" chute, which has now practically been worked out. Extensive workings have so far failed to prove any other payable ground, and as far as the mine itself is concerned it is not likely to yield many further dividends. The company possesses fine surface machinery, including a fifty stamp mill and cyanide works, and also a big heap of fairly rich tailings. Any value the shares may have comes from these assets, not from the value of the mine itself, and, on the whole, speculators would be well advised to leave the shares alone.

Phœbe.

Phœbe.—This mine possessed the smallest possible fringe of the "Brilliant" chute within its area. This rich ore has now been worked out, and the mine cannot pay dividends upon any of the ore remaining so far as the values are known. The shares are, therefore, a poor speculation.

Brilliant St. George.

Brilliant St. George.—Issued capital, 144,000 10s. shares; of these 72,000 are fully paid, and 72,000 have uncalled liability of 3s. 6d., which is never likely to be called up.

This is the best mine at Charters Towers, and the shares offer a profitable investment almost entirely free from risk.

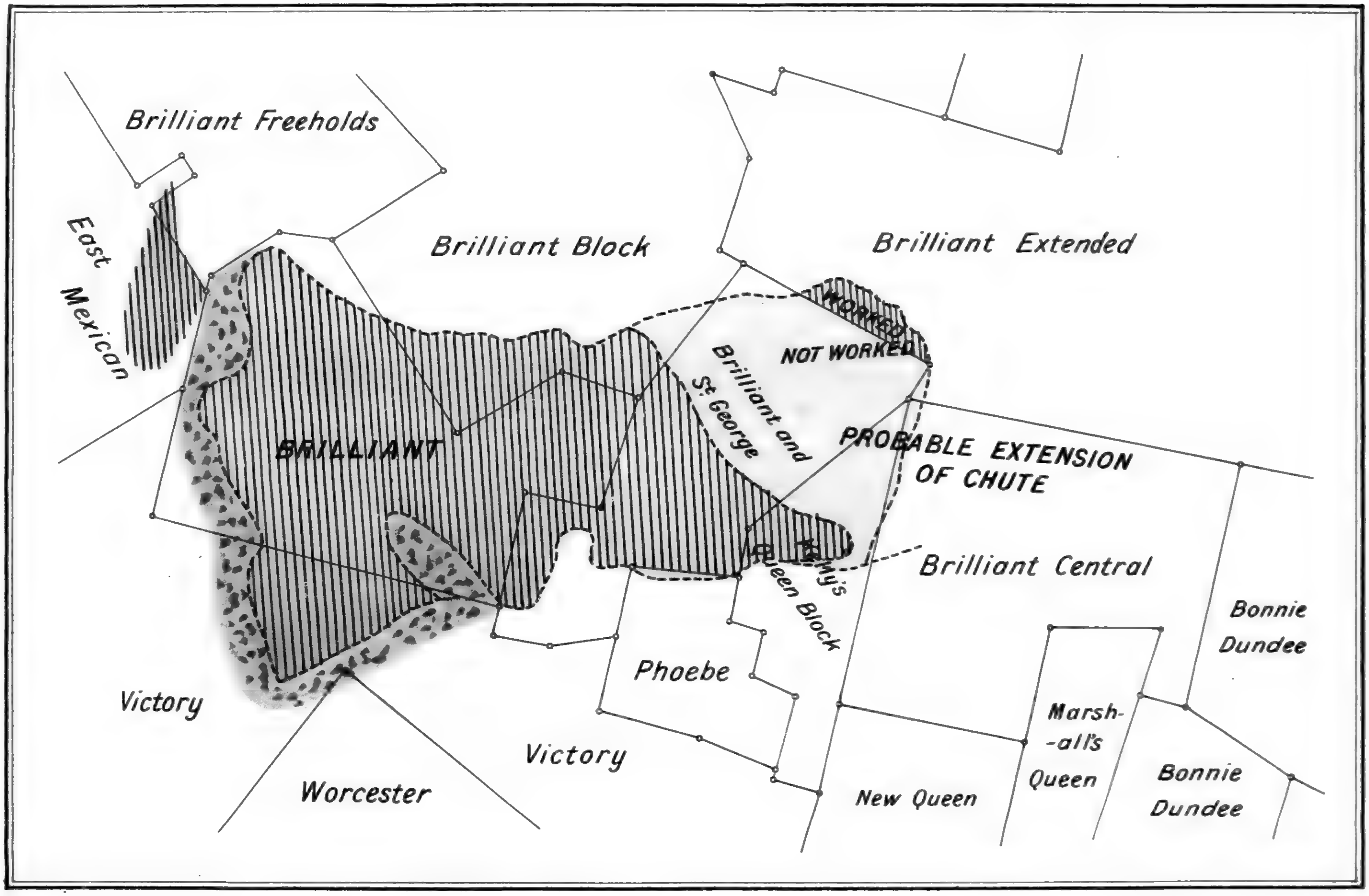
Almost the whole area of this property, 18 acres in extent, is situated in the heart of the "Brilliant" chute, while the chute ore here is unusually wide and above the average value.

To the end of 1898 the mine produced, from the "Brilliant" reef about 115,000 tons for 165,000 ozs. from the mill alone, and further large sums from the sales of tailings and concentrates. From these results dividends of £310,000 have been paid.

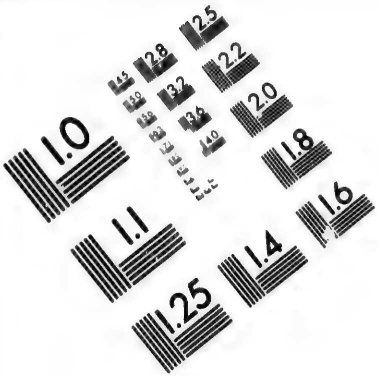
The lode is a blueish white quartz, highly mineralised with galena and pyrites, and is generally split up into two or three sections, giving an aggregate width, in all the lower workings, of six feet.

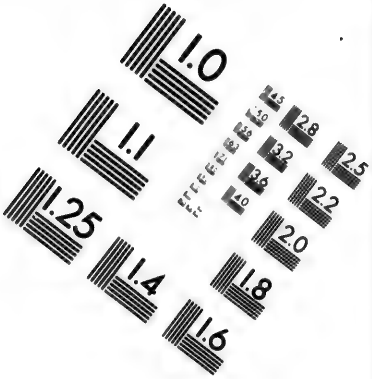
At the time of my visits to the mine the incline shaft had still to go another 600 feet to reach the lower boundary. Outside of that boundary, a fact of the utmost importance, the Brilliant Extended mine has worked out the reef. Going down that mine, you can walk along the boundary line of the Brilliant and St. George for 400 feet, and see a reef averaging five feet thick, and worth 30 dwts. standing for the whole distance. It is this fact which makes me so positive in assuming that all the ore yet to be met with in the 600 feet of undeveloped ground of the Brilliant and St. George will reach the average width and value of that now being treated. The unworked portion of the Brilliant and St. George (dating from July, 1898) was equal to 800 feet deep, 700 feet long, and six feet wide. This area, together with pillars standing in the upper levels, gives at least 300,000 tons of ore.

The mine has its own crushing plant, consisting of Huntingdon mills. It has recently taken over the treatment of its own tailings, previously let on contract, and from 1899 it may be expected to crush 30,000 tons per annum. This gives a life of 10 years. Working costs will not be more than 35s. per ton all told.



CHARTERS TOWERS.—THE "BRILLIANT" CHUTE.





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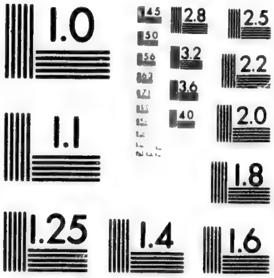

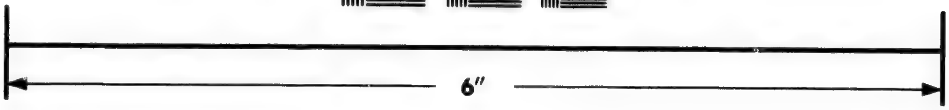

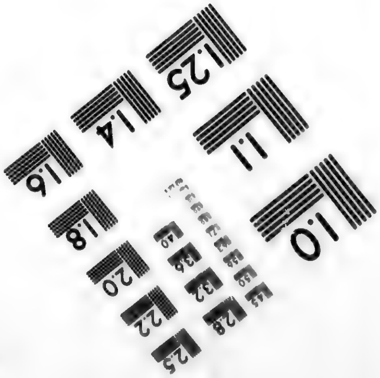

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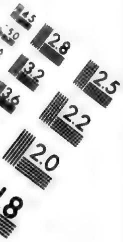
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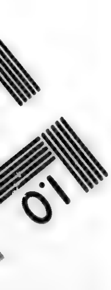
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The total yield, from all sources, will not be less than in the past.

Assured value of Brilliant St. George shares.

A safe estimate of the future of the Brilliant St. George (reckoning from July, 1898), is as follows :—

Tons treated monthly	2,500
Ozs. produced	3,600
Value	£13,000
Costs, at 35s. per ton	£4,375
Monthly profit	£8,625

equal to a monthly dividend of 1s. per share (absorbing £7,200), with a yearly surplus, in addition, of £17,100. (It is not unlikely that the dividend will actually average 1s. 3d. per share per month.) This dividend of, say, 14s. per annum will continue for ten years from July, 1898. During that period, so far as any certainty exists in mining, the company will pay £7 a share. It is a matter for each individual investor to calculate for himself what Brilliant and St. George shares are worth, but their lowest intrinsic value may be placed, at least, at £3 10s., at which price they form one of the most attractive mining investments that I have met with.

Kelly's Queen Block.

Kelly's Queen Block.—Issued capital, 144,000 10s. shares, of which 96,000 are fully paid, and the remainder have an unpaid liability.

This mine has a small area, only eight acres. The "Brilliant" reef was cut at 1,500 feet deep; at first the ore was of low value, but deeper workings penetrated the chute, and about 3½ acres of really rich ore undoubtedly exist in the mine. Regular crushings have now commenced and during the next year or two good dividends will certainly be paid. If purchasers of shares make due provision for the fact that the mine will be exhausted in a year or two, they may in the meantime reckon upon good dividends, and may with safety place a present value on the shares of 18s. or 20s.

Brilliant Extended.

Brilliant Extended.—Issued capital, 200,000 10s. shares, of which 150,000 are fully paid.

This mine is the immediate deep level of the Brilliant St. George. It will be remembered that a fringe of chute ore was found here, which has been worked all along the Brilliant and St. George boundary, exposing there a valuable patch of ore. All the chute ore in the Extended, however, has now been exhausted. Apparently the chute has either ceased to exist at this depth, or it has turned rapidly to one side, as all exploration in the mine has failed to find any more rich ore. Exploration still continues, and it would be rash to state that it will not eventually be successful. In the meantime, however, although the shares have a distinct speculative value, the intrinsic value of the mine is *nil*, and it is only for speculation, as opposed to investment, that a holding in the company may be considered advisable.

Brilliant Central.

Brilliant Central.—Issued capital, 100,000 £1 shares, with a liability of about 2s. on each share.

These shares are undoubtedly the best speculation, as opposed to investment, in Charters Towers. The mine has as yet no intrinsic value; not a ton of payable ore has yet been discovered; the workings have already reached a depth of 1,800 feet or so. But it is almost certain that unless the "Brilliant" chute suddenly ceases to exist at 2,000 feet deep, and immediately after showing such favourable conditions of value as in the St. George and Kelly's Queen—it is certain, I repeat, that the chute if it persists in depth must continue on into the Brilliant Central. As yet, the deepest workings have not reached the line of the chute, but a strike may be made at any time. On this strong assumption the shares at the present price [Note B] are an excellent speculation, and as a speculation, pure and simple, may be recommended.

Brilliant Deep Levels.

Brilliant Deep Levels.—Issued capital, 200,000 £1 shares, of which 170,000 are fully paid.

This company, with an area of 25 acres, sunk a shaft and cut the Brilliant reef at a vertical depth of 2,200 feet. Those responsible for the policy of the company had evidently not studied the trend of the "Brilliant" chute, and consequently the shaft, and indeed the whole area of the property, is far out of the line of rich ore carried by the Brilliant and St. George chute. A good deal of sound work has been done, but no good ore has been found. The reef is large and well-defined, but almost valueless, and doubtless when the cash resources of the company are exhausted it will be allowed to remain shut down.

This completes the account of the "Brilliant" reef, and the eleven mines working on that line. There is no evidence that any other reef lying deeper in the formation exists, but doubtless, some day, cross-cutting will be done by one or more of these mines to decide the point. If a new and payable reef or reefs were discovered it would, of course, add greatly to the value of all these shares, but on the whole the probability is that no such reef or reefs exist.

"Day Dawn" reef.

The "Day Dawn" line of reef has been the most valuable lode known in the Charters Towers field, but much of the best ore is now worked out. It has yielded in profits:—

Day Dawn (P.C.)	£613,000
Day Dawn and Wyndham ...	540,000
Mills' United	292,000
	£1,445,000

At present, on this line, the position is roughly as follows:—

The Day Dawn (P.C.) is worked out; the Day Dawn and Wyndham is a regular producer, with a large amount of payable ore in sight; Mills' United has no payable ore in sight, but is sinking in the hope of finding another chute; Day Dawn Freehold Consolidated, the deep level of the Wyndham, is sinking to cut the reef. The remaining mines on this line are unimportant.

Day Dawn (P.C.).

Day Dawn (P.C.).—Issued capital, 500,000 £1 shares, fully paid. The mine may be considered as worked out. There is actually some ore in sight but it cannot be mined with profit, and there is little likelihood of another reef being discovered. The real asset of the company consists in about 200,000 tons, perhaps more, of tailings which are now being treated, and which will yield a total profit, in all probability, of £75,000, or 3s. per share. As the shares stand at this price in the market they do not leave any room for speculation.

Day Dawn Block and Wyndham.

Day Dawn Block and Wyndham. Issued capital, 500,000 £1 shares, fully paid.

This mine, which has been a highly successful enterprise for years, still contains probably at least eight years' ore, most of which is opened up and proved to be of fair average value. This ore should yield a 6d. dividend several times a year. The company owns a fine battery and tailings plant, and has a large reserve of untreated tailings—a valuable asset. The value of this mine can by no means be so accurately gauged as can that of the Brilliant and St. George, and it would be an unwarranted statement to say that the shares, at, say, 14s. would certainly yield an eventual profit. It may be said, however, that at about that price they offer a fairly good speculative purchase.

Mills' Day Dawn United.

Mills' Day Dawn United.—Issued capital, 300,000 £1 shares, all of which have an uncalled liability of 4s.

For some years this company paid large dividends from the working of a chute of ore which is now exhausted. The property is of large area, and there is quite a probability that deeper working will penetrate into chute ore now found in the Wyndham. The mine is soundly managed. In the middle of the Mills' Day Dawn United mine is a block of ground which does not belong to the company but which is known to contain rich ore. It is said that the owner of this ground, who now asks £40,000 for it, was intimately connected with the flotation of the Mills' United, and gave his assurance that the ground in question was included in that flotation. At their present price [NOTE B] Mills' Day Dawn United shares are a fairly good speculation.

Day Dawn Freeholds Consolidated.

Day Dawn Freeholds Consolidated.—Issued capital, 150,000 £1 shares, of which 100,000 are fully paid. A shaft is being sunk on this property to cut the reef below the Wyndham, at an estimated depth of 2,000 feet. The work is being soundly done,

CHARTERS TOWERS.

It is extremely probable that good ore will be found here, and as the shaft approaches the reef the shares are likely to rise in value.

The other mines on this line do not call for special notice.

"Victoria" reef.

On the "Victoria" line of reef the most important mine is the **Victoria G. M. Association,** with an issued capital of 144,000 £1 shares with no liability. The mine has produced to the end of 1898 about 55,000 tons of ore, which yielded dividends to the extent of £240,000. The mine has now been developed to the lower boundary, but a lot of ore remains standing. A new and valuable reef in the footwall, probably an offshoot from the reef now being worked, was recently cut and will add considerably to the life of the mine. It is probable that the Victoria will have a life of at least five years from the beginning of 1899, and that during that period, from ore in sight, it will pay its usual dividend of 6d. per share every two months. This would give a total dividend from the mine yet to be declared of 15s. per share, and at the present price of 7s.—8s., the shares form a safe and really good investment.

Victoria and Caledonia.

Victoria and Caledonia adjoins the Victoria and has recently begun to work the reef. The lode is rich but narrow. Small profits may be expected.

Victoria No. 1 West.

Victoria No. 1 West has little ore of value remaining.

Clark's Brilliant Worcester and Victory.

Clark's Brilliant Worcester and Victory.—Issued capital, 120,000 2s. shares, all carrying a small liability. This company, after working out several of the upper series of reefs, is sinking in the hope of striking the Victoria reef. Should this take place some good ore will probably be found and the shares may rise.

Band of Hope.

Band of Hope.—Issued capital, 60,000 shares of £1 each; 48,000 are fully paid. This mine is really the deep level of the Victoria. Two reefs are being worked, and a good deal of ore is opened out. The workings in the Queen Cross mine have exposed a rich body of ore lying on the Band of Hope boundary, which in the ordinary course of working will not be available for some time to come. This lower stretch of ore is richer than the rest of the ore in the mine, and may be expected to add to the profits when it can be mined. It is safe to estimate that the Band of Hope will pay dividends for the next three or four years, and, although the grade of the ore cannot be accurately gauged, the shares are probably a sound investment at par.

New Queen.

New Queen.—This mine has done a lot of development work on the "Victoria" reef, but practically all the ore opened out is unpayable. It is evident that the richest chutes of ore dip in the opposite direction to which the mine is located. There are other reefs existing in the mine, but the outlook is a poor one.

Queen Cross.

Queen Cross.—A few acres of rich ground, on the line of the main Victoria chute, existed in this mine, but most of this ore has been worked out, and that remaining is of much lower value. The future does not promise well.

Papuan.

Papuan.—Issued capital, 96,000 2s. 6d. shares, all of which have an unpaid liability. This mine, after working out the shallower reefs in the property, is now at work on the two sections of the "Victoria" lode. These give good results, and there is undoubtedly several years of payable ore to be mined. The future dividends cannot be definitely calculated, but at the present price [NOTE B] the shares may be looked on as a fairly good speculation.

On the shallower lines of reef several companies are still at work, but with, on the whole, small profit.

Victoria and Queen.

Victoria and Queen.—Issued capital, 48,000 £1 shares, of which 29,500 are fully paid. Some good ore was being opened up here at the time of my visit, while a large area of the property was still quite undeveloped. Results promised to be good for some years to come, and the shares may be looked upon as a good speculation.

Queen Central.

Queen Central.—This has been, on the whole, to date, a disappointing mine.

Craven's Caledonia.

The same remarks apply to **Craven's Caledonia, Marshall's Queen** and **No. 7 N. E. Queen.**

Bonnie Dundee.

Bonnie Dundee. Issued capital, 132,748 £1 shares. The reefs now being worked in this mine are quite unpayable, but should the "Brilliant" chute be discovered in the Brilliant Central, the Bonnie Dundee ground, which adjoins the Brilliant Central, would appreciate greatly in value. For this reason Bonnie Dundee shares, provided the mine is not seriously in debt, should at present prices be a good speculation.

There are no other mines at Charters Towers that call for criticism.

Croydon and Etheridge fields.

The Croydon and Etheridge fields are situated still further north in the colony than Charters Towers; they are reached from the Gulf of Carpentaria. I did not visit these districts.

Croydon commenced to yield gold in 1886, and up to the end of 1897 had turned out 403,000 tons for a yield of about 67s. per ton. Croydon bullion is of exceptionally low value, so that returns made in ozs. and dwts. are extremely misleading to distant shareholders, and should be heavily discounted.

There are a great number of reefs in the district, many of which undoubtedly offer good mining risks to those who are prepared to put up capital for their development. This, however, would have to be done with great circumspection, and only upon the report of a reliable engineer. Local mining men have an unenviable reputation.

Croydon flotations.

English companies floated at one time or another to work Croydon reefs, are the **Croydon Consols, Jubilee Consols, La Reine d'Or, North Croydon Consols, Lady Isabelle,** and **Waratah.** Of these the first appears to be the only mine which has paid dividends, and these of an irregular nature. This is no reason, however, why the possibilities of the field, under sound and honest management, should be neglected.

Etheridge.

Etheridge is another district which deserves considerable attention from prospecting and exploration syndicates. No English floated mines are at work here; no capital enters the district; and the "fossicker" remains almost in sole possession of the many reefs known to exist.

The following remarks are taken from the 1897 report of the Warden of the Etheridge field: The district has yielded an average yearly output of 20,000 ozs. for the last twenty years. The chief obstacles in the way of mining are:—(1) the yearly drought; (2) slow communication with the coast, there being no railway beyond Croydon; (3) no adequate process for the treatment of the complex and refractory ores which, with the means at command, rarely yield more than 50 °/₀ of their contents. The only thing wanting, apparently, in the Etheridge district to bring about considerable success, is the introduction of working capital, which must be honestly spent.

Conclusion.

In conclusion, the excellent prospects offered to-day to the prospecting or exploring syndicate in any district in the Queensland gold belt may be again referred to. But for such ventures to be successful they must be in the hands of hard-working, practical, and, above all, honest men, while all the working capital raised should be legitimately employed.

Classification of the best Queensland mines.

The investor or speculator who prefers merely to buy shares in established concerns, should study the following lists:—

Dividend Paying.		Pureiy Speculative.
First Class.	Second Class.	
Mount Morgan Brilliant St. George Brilliant Victoria Kelly's Queen	Selected Gympie Mines Deep Levels Day Dawn Block and Wyndham Victory Papuan Band of Hope Victoria and Queen	Brilliant Central Brilliant Extended Bonnie Dundee Clark's Worcester Mills' Day Dawn United

All these mines, as investments or speculations, are, of course, subject to the qualifying remarks I have made about them, but on the whole they form a good group of mines, and worthily represent the colony which in time to come promises to be the greatest mining district in Australasia.

CHAPTER VII.

THE GOLD MINES OF NEW ZEALAND.

Introductory.

GOLD was first discovered in New Zealand in 1857. The official returns up to the end of 1897 show a total yield of gold to the amount of £53,372,634, and of silver, which is usually associated with the gold, to the amount of £202,724.

With the exception of a mine here and there, the industry had, until 1894, been completely in the hands of the colonists, and both from quartz mining, hydraulic sluicing, and alluvial digging, large profits had from time to time been secured.

About the year 1894, a number of locally owned mines all over the colony, either owing to the poorness of the ore, disturbed country met with, or from lack of capital outlay, had ceased to be profitable and had been shut down; most of the best sluicing claims, too, had become worked out; while the alluvial digging had almost completely ceased; the gold-mining industry of New Zealand was, in fact, in a highly unsatisfactory condition. Then a remarkable change took place.

The mine flotation mania connected with the great "boom" of 1895 spread from South Africa and West Australia to New Zealand. A perfect deluge of flotations ensued: mines which had been worked out or proved worthless by local mining men were eagerly placed at the disposal of company promoters; English and Johannesburg syndicates and exploration companies vied with each other to secure every bit of available ground; nearly the whole of the Hauraki peninsula and Upper Thames was floated off into limited liability companies; a series of dishonestly

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NOTE.—The New Zealand mines were visited in September, 1898.

worded prospectuses appeared in London, and the investing public was thoroughly fooled in the usual manner.

Worthless flotations.

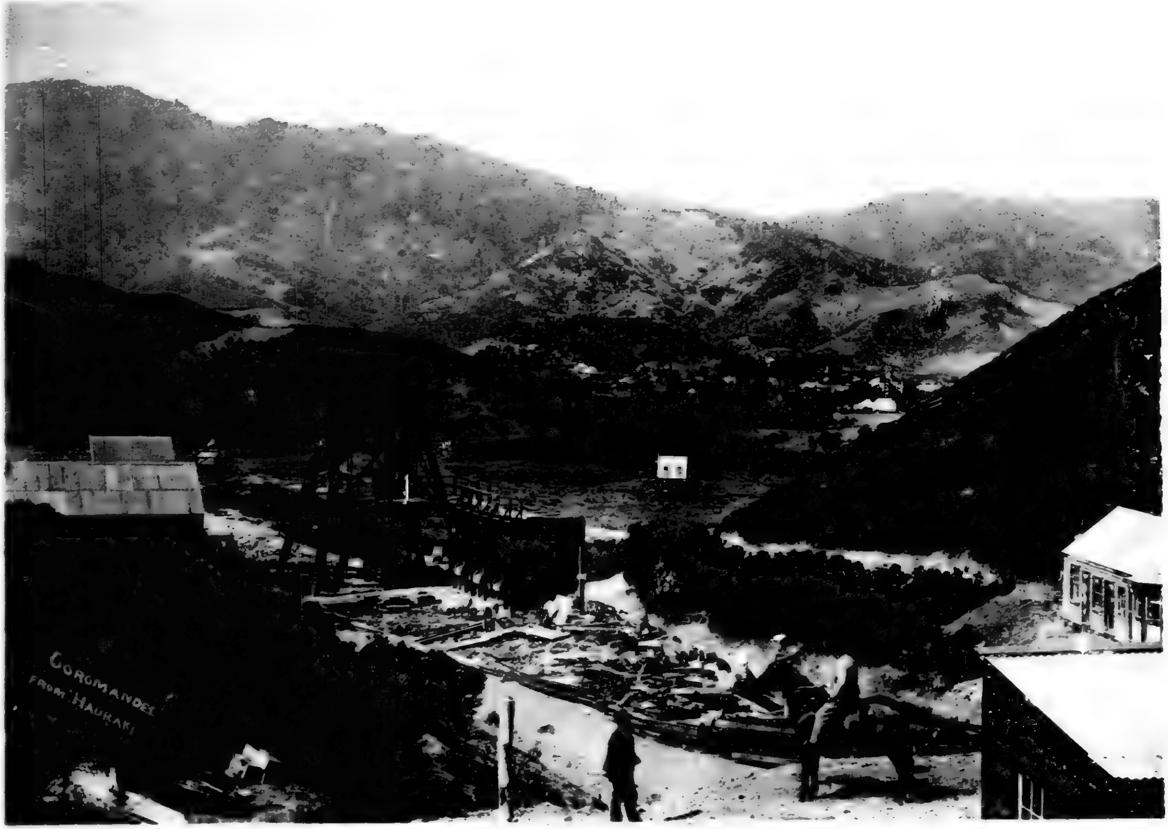
The result of all this was, that, whereas before the boom there had been less than a dozen English mines in New Zealand, there were now about 100 mines, and thirty exploration and finance companies, the great majority of which had been floated on untested ground, or on ground which had been worked out or had been proved worthless.

Then exploration and development commenced with, of course, extremely bad results, and, by the middle of 1898, one fiasco after another had reduced the market for New Zealand shares to a state of complete collapse.

It was shortly after that period that the writer visited the colony. I inspected some twenty-five of the principal mines working, and gained reliable information about the majority of the remainder. Every facility for access to the mines was given without exception, and all information that could reasonably be expected was placed at my disposal. Only one conclusion, unfortunately, can be arrived at, namely, that the majority of the mines are worthless; but, at the same time, there are perhaps a dozen mines which may be safely classified as either really sound investments or favourable speculations, and to all of these due justice will be done.

Mining Laws.

To return for a few moments to local conditions; it may be stated that there is really little to be found fault with in the mining laws of the colony. The Government has been frequently abused for its mining regulations; but this has been rather by way of excuses to disappointed shareholders, than from any definite grievances which managers or directors have against the mining laws. There is only the usual tax of 5 per cent. on dividends, and exemption from the somewhat severe labour conditions can always be secured from the Minister of Mines when a satisfactory excuse is forthcoming. The Government report on mines, published yearly, is a very complete statement, and is the best report issued by any of the colonies.



HAURAKI MINE.

Another sound feature about New Zealand mining is the fact that all assays and all returns are made in sterling value, not in troy weight or bullion. The reason for this is that there is a large amount of silver associated with the gold in some districts, and the bullion, which in parts of the South Island is worth from 78s. to 80s. per ounce, is only worth from 10s. to 30s. per ounce in the North Island. Whatever the reason, however, it is infinitely more satisfactory to shareholders and, indeed, to directors and managers that the valuation of ore or bullion by ounces and dwts. should be superseded by the valuation by £ : s. : d.

The writer once endeavoured to secure this method of ore valuation in the monthly returns of the Witwatersrand Chamber of Mines, but the more casuistic method still obtains in that otherwise enlightened locality.

The various gold fields.

The principal gold fields of the colony are:—

(*a.*) Coromandel.
(*b.*) Thames.
(*c.*) Upper Thames, in the North Island.
(*d.*) West Coast.
(*e.*) Otago, in the South Island.

Nearly all the English floated mines are in the neighbourhood of one or other of these centres. No mines in the world are so picturesquely situated as those of New Zealand. All those in the North Island are situated on, or near, the Hauraki peninsula, a mountainous stretch of land running far out into the sea, surrounded by an archipelago. The mines are frequently situated high up on the forest-clad mountain ridges, from which exquisite vistas of seascape and islands are visible on each side of the peninsula. On all sides, one is surrounded by glorious vegetation, giant tree-ferns, and waterfalls, whose contents are lower down used to more practical though less picturesque advantage. On the west coast of the South Island the mines are situated in the recesses of immense and gloomy forests, which cover hill and dale, and where it is almost always raining, while in Otago, snow-clad ranges of mountains keep eternal company with the mining population working on their lower slopes, or dredging on the broad and sandy rivers which flow from their base.

We must now return to a description of the mines, summarised under their different districts, with the unpleasant recollection that though there are a few here and there which are well worth description, the majority are already proved to be worthless.

Coromandel.

The Coromandel district had been worked with more or less success by local companies or syndicates for thirty years. The characteristic feature of this field consists of narrow leaders or stringers of quartz, frequently in disturbed country, which do not carry gold regularly throughout, but in small rich patches here and there, so much so that the discovery of a patch of gold contained in a hundredweight of stone, has often been sufficient to make up for months of previous unprofitable development. In days gone by, and, in the case of the Hauraki mine, as recently as two years ago, a number of these rich patches have been found within a small area, and temporary large profits have resulted. Apparently, however, these patches have been found at shallow depths, not exceeding 300 feet or so, and any mines which had reached a greater depth had ceased to continue payable.

All Coromandel mines are poor.

It is easy for anyone to realise that this sort of mine belonged to the most dangerously speculative class, but no doubt the prospectuses of the twenty-nine mines, floated at the time of the boom, to work the Coromandel reefs did not display these features in undue prominence. They all doubtless alluded, preferably, to the success of the Hauraki, which had been floated some years previously, and which at that time was earning handsome profits. The first English mine which had been floated at Coromandel was the Kapanga. It had not been a success, having twice suffered reconstruction, but, having sold a portion of its ground to the Hauraki, the latter mine earned big profits for a time. These were, so far as I gathered, the only English mines in existence at Coromandel up till the time of the boom. There are now thirty-one English mines in the district, as set forth in the following list :—

* Blagrove's Freehold.
* Britannia (Hauraki).
* Dolcoath.
* East Hauraki.
* Golden Lead (Hauraki).
* Golden Pah (Hauraki).
Hauraki.
Hauraki Associated.
* Hauraki Golden Bay.
* Hauraki Main Lodes.
* Hauraki South.
* Irene (Hauraki).
Kapanga.
Kauri Freeholds.
* Kapai Vermont.
* Kathleen.
* Kathleen Crown.
* Maoriland.
* Mariposa.
* New Hauraki.
* North Kapanga.
* Peveril.
* Preece's Point.
Royal Oak (Hauraki).
* Scandinavian.
* Southern Star.
* Scotty's Hauraki.
* Success.
* Tokatea Consols.
* Triumph (Hauraki).
* Waitaia.

Against the names of all the above thirty-one mines in which developments have so far totally failed to expose ore of permanently payable value, an asterisk (*) has been placed, and it seems unnecessary to refer to these mines in detail.

Of course, it is not certain that *all* of these twenty-six condemned mines will never be payable under any circumstances; most of them have still cash in hand and are being developed, while the shareholders in others will probably find additional funds for the purpose of further explorations; but the certainty remains that the great majority are already in a hopeless condition. This result is only what was to be expected from a series of unwise flotations such as those under notice.

With regard to the remaining five mines on the list, the following remarks are offered :—

Hauraki.

Hauraki.—Capital, £40,000, in 320,000 2s. 6d. shares; cash on hand, £30,000. This mine has worked a number of quartz leaders, crossing each other in all directions, to a depth of about 300 feet, and owing to a number of rich patches of gold having been found, has paid dividends approximating to £140,000. At the present depth the rich patches are becoming scarcer, apparently beginning to die out, and on its present returns the mine is hardly paying expenses. Of course, the rich ore may be encountered again at any time, but the chances are that the richest area has already been worked out, and that the future will be disappointing.

Hauraki Associated.

Hauraki Associated.—Capital, £90,000, in 450,000 4s. shares. A narrow leader is being worked which contains patches of gold over a distance of several hundred feet, and furnishes fifty or sixty tons of ore per month. The yield averages about £8 per ton, but owing to the small amount of ore which the mine is capable of supplying, there is no profit. According to the plan of the property, the reef will dip out of it about three levels below that now being worked, so that even were the reef payable, which it is not, the life of the mine would be a very short one.

Kapanga.

Kapanga.—Capital, £280,000 in £1 shares—19s. 6d. paid. The shaft has been sunk 1,000 feet, probably the deepest in New Zealand, but below 400 feet no payable ore has been found. Operations are now confined to further prospecting of the numerous leaders at the 300 and 400 foot levels. Patches of gold are occasionally met with, but the mine is being regularly worked at a loss, and there does not seem much chance of any permanent improvement.

Kauri Freeholds.

Kauri Freeholds.—Capital, £250,000 in £1 shares, and £50,000 7 per cent. debentures. This mine is situated about fifteen miles from Coromandel. The principal development work is on a large reef which, although low grade, is said by the manager to be payable, and a large amount of money is being spent. While not affirming that the mine *is* going to be a certain success, it must be remembered that this class of

ROYAL OAK—HAURAKI.

reef forms a much sounder sort of mine than the narrow and patchy leaders of which nearly all the other mines in the district are composed.

I did not visit this property.

Royal Oak of Hauraki.

Royal Oak of Hauraki.—Capital, 956,944 5s. shares. The Royal Oak of Hauraki is the most promising of the rich patch mines of Coromandel. A well-defined chute of ore exists, in which the rich patches occur with frequency. This has been opened at several levels. It is quite impossible to estimate the quantity or value of ore reserves in a mine such as this, but probably there are four years of payable results in sight. A large amount of money is being spent in driving adit levels and crosscuts to reach the reef, and in water races to drive a central plant which will furnish compressed air for milling, pumping, hauling, and ventilation. This new equipment will be completed early in 1899, and as some additional stamps will then be started to mill second-class ore, larger outputs may be looked for. The Royal Oak, of course, is not a *good* mine, but it is likely to prove more satisfactory to its shareholders, at least for some years to come, than any of the other mines of the district.

Before finishing this criticism of the mines of the Coromandel district, which, although it has been exceedingly unfavourable, is by no means exaggerated, it is only fair to add that much of the work accomplished has been of a sound nature. As a rule, the shafts are well sunk and timbered, and have been equipped with efficient hauling and pumping plants; the underground work, also, has been usually carried out in a miner-like fashion. The aggregate result of all this expense and labour is appalling in its poverty, but no other result could legitimately have been expected.

Thames.

The Thames field is some forty miles south of Coromandel. For many years this district was actively worked by the colonists, and a number of mines, notably the Caledonian, returned large profits. As in the case of Coromandel, most of the mining has consisted in the search for rich patches of gold, but here again there was a notable decrease in the number of such patches discovered when the workings had reached a depth of from 300 to 500 feet. At the time of the boom, when over a dozen English mines were floated here, it was explained by the promoters that, although the "patch" mines were not so rich as formerly, there were numbers of large low grade reefs in the district which the local mining people had *unaccountably* omitted to test, but which, it was stated, were in reality highly payable. Subsequent developments on these reefs have proved them to be so uniformly worthless that the local mining men seemed to have shown considerable method in their neglect. The managers of these mines, egged on probably by the directors, proceeded to the usual method of erecting costly mills and machinery before having proved their mines, and the consequence is that the mines are shut down, while the locality is now dotted with handsome batteries which are for sale.

A list of Thames flotations.

The following is a list of the thirteen English mines floated at the Thames :—

* Ethel.
* Gloucester.
* Hauraki Golden Age.
* Kuranui Caledonian.
Mahara Royal.
May Queen (Hauraki).
* Monowai.
* N. Z. Broken Hill.
New Alburnia.
Tararu Creek.
Thames Hauraki.
Whangamata.
* Moanataiari.

As in the case of Coromandel an asterisk (*) has been placed against the names of those mines which have so far failed to find payable ore. Several of these mines are still being developed, and may possibly come upon low grade bodies of ore which will yield a small profit if treated in bulk, but the chances are much against such a supposition. The following particulars about the remaining mines on the list may be of value to shareholders :—

Mahara Royal.

Mahara Royal.—Capital, £150,000 in £1 shares. A low grade mine. A small battery is at work, and the ore treated is apparently just paying expenses. As the reef is about six feet thick it is possible that a larger battery could be kept at work, but too little is as yet known about the ore to warrant the statement that the mine will be a payable one.

May Queen.

May Queen. Capital, £200,000 in £1 shares. This mine, one of the rich patch mines, is being worked on a small scale, with an occasional monthly profit of several hundred pounds. At present, operations have to be carried on above the water level, at 520 feet deep, but it is expected that when the water level has been lowered, by pumping operations in the adjoining Thames Hauraki mine, some ore of better value, which is known to exist, will be got at. The mine does not promise to be permanently profitable.

New Alburnia.

New Alburnia. Capital, £170,000 in £1 shares. By rights this mine should be classified among those that have failed to prove any payable ore. A large amount of exploration has been done, but the rich patches encountered have been few and far between. The week before my visit to the mine, a new reef was discovered at a depth of 600 feet. The reef is large and a trial crushing of a few tons, although low grade, proved to be just payable. It is unlikely that this reef will be permanently payable, as all the other reefs yet found in the mine are of a treacherous nature.

Tararu Creek.

Tararu Creek.—Capital, 190,000 10s. shares. Apparently this is a mine of some little promise. In the old days the mine, as a local company, was profitably worked, and the newer workings prove the continuance of a well-defined lode in depth. The reef is a large low grade body of ore, of which the payable section averages thirty inches. The gold is evenly distributed, not in patches, and so far, has been proved payable for a length of 500 feet. It is probable that further exploration will prove the chutes to be payable for a greater distance than this. There are 30,000 tons of ore in reserve from which the manager hopes to extract 27s. per ton at a cost of 18s., and with a new thirty stamp mill and cyanide plant, to crush from 1,600 to 1,800 tons per month. The ore reaches the mill through an adit tunnel, half-a-mile long, and the general arrangements for cheap working are efficient. If this mine is satisfactorily financed it is possible that it may, under its present management, become successful, although, of course, on a small scale.

Whangamata.

Whangamata.—It is credibly reported to me that this mine is promising well.

Thames Hauraki.

Thames Hauraki.—This company was recently absorbed by the Standard Exploration Company, the shareholders receiving shares in that over-capitalised concern.

The feature of this mine is an immense pumping plant capable of raising 2,000 gallons a minute from a depth of 2,000 feet. This plant has already cost over £100,000, £25,000 of which was received as subsidy from Government, but the expenditure is not nearly completed yet. When the pump is ready, early in 1899, the old workings at a depth of 600 feet will be unwatered, and, as the shaft is gradually sunk, it is expected that the whole of the mines in the neighbourhood will be drained through it. The manager of the Thames Hauraki states that before the mine was flooded out, exploration at 600 and 700 feet had proved the existence of payable ore, which still remains in the mine. It is thought that the pumping plant is far too large for requirements, and that an equally satisfactory plant could have been erected for about half of what the whole will eventually have cost. The future is more or less problematical.

Upper Thames.

The Upper Thames, or Ohinemuri, district lies about twenty to thirty miles south from the Thames, and is by far the most important mining centre in New Zealand. Here the reefs are of an entirely different nature from those at Thames or Coromandel; they are usually very large, often varying from ten to thirty feet in width; suffer little from disturbed or faulted country, and bear every indication of carrying their gold contents to a great depth. Of course, only a few of these reefs have yet been proved payable, but the fact of their gold contents being distributed evenly through the reef, whether in payable or unpayable quantities, and not in the few and far between "rich patches," makes their development a much more justifiable action than the development of mines at Coromandel or Thames.

List of Ohinemuri mines.

The following is a list of the Upper Thames mines:

- * Aroha.
- * Hikutaia.
- Komata Reefs.
- * Komata Consolidated.
- * Key of Komata.
- * Maori.
- * Maori Dream.
- * Montezuma.
- N. Z. Crown Mines.
- N. Z. Jubilee.
- N. Z. Talisman.
- * Norman Proprietary.
- * Ohinemuri Syndicate.
- * Royal Standard.
- * Tui.
- * Victor-Waihou.
- Waihi.
- Waihi Grand Junction.
- Waihi Silverton.
- Union Waihi.
- * New Waihi.
- * Waihi Proprietary.
- * Waihi Gladstone.
- * Waihi Consolidated.
- Waitekauri.
- Waitekauri Extended.
- * Waitekauri Cross.
- * Waitekauri Union.
- * Waitekauri United.
- Woodstock.

Of the above thirty mines nineteen have been marked with an asterisk (*), as not worth extended criticism. Explorations have failed to prove permanently payable results for any of these mines, and the chances are that most of them will go into liquidation before long. It will be noticed that a number of mines bearing the names of Waihi, or Waitekauri, have sprung up in the neighbourhoods of these good mines, but they have no connection with the reefs now worked in the Waihi or Waitekauri. Several of these unfairly named mines have already gone into liquidation, and most of the remainder are likely to follow their example before long.

Concerning the eleven mines of the district that are worth describing, all of which were visited by me, the following statement may be of value to shareholders:—

Komata Reefs.

Komata Reefs.—Capital, 400,000 5s. shares. Absorbed Komata Queen. There is a main reef of from three to four feet thick, which throws out narrow stringers, several of which carry payable gold, but cannot be relied on. The length of the payable chute on the main reef is less than 200 feet, and, although this chute may continue in depth, it is at once evident that the capacity of the mine is extremely limited. In fact, at the time of my visit, ten out of the twenty stamps were standing idle because the mine could not supply sufficient ore to feed the battery. The value of ore crushed and cyanided is about £3 per ton. A new adit level, 3,000 feet long, is being driven, and a good deal of money is being spent on this, and on the erection of an air-compressing plant for driving the tunnel. Small profits are being made, but these will be more than swallowed up by the expenses of mine development such as those just indicated, and taking into account the small length of chute ore in the mine, it seems improbable that it will ever become dividend-paying.

N. Z. Crown Mines.

New Zealand Crown Mines.—Capital, £200,000 in £1 shares. The reef worked by the Crown Mines crops out at the base of a mountain, into the heart of which a series of levels has been driven for over 2,000 feet. Below water level a fine shaft, 29½ feet within timbers, and containing powerful pumping and hauling gear, is being sunk on the reef at an angle of about 50 degrees. A central compressor, driven by water power, is used for both hauling, pumping, rock drills, and ventilation, and is proving most economical. There are several hundred thousand tons of ore exposed on the reef, which is about 3½ feet thick, and is standing intact through a great part of the mountain; the ore body below water level, of which a considerable quantity has already been developed (No. 7 level), maintains its size and value. The average yield of gold in the future is estimated at 34s. per ton, and the greater portion of the ore in sight will give this return. The battery consists of sixty stamps, which will shortly be increased to eighty. The method of extraction is wet crushing by the introduction of the cyanide solution direct into the mortar boxes, the Crown Mines being the first company in the world to adopt this process. It is successful—the residues assaying only 8s. per ton. The costs therefore are, of course, much lower than they would otherwise be.

An estimate of future profits is as follows:—

Eighty stamps will crush 3,800 tons per month, yielding 34s. per ton profit, or	£6,450
At a cost of 25s. per ton ... or	4,750
Leaving a monthly profit of	£1,700

equal to a yearly profit of £20,400, from which a 7½ per cent. dividend, absorbing £15,000, would probably be available. There is little doubt but that this return, from ore already in sight, can be kept up for a number of years, and as the mine is finely equipped with machinery, and ably managed, it may safely be estimated as a thoroughly sound venture. The value of the shares may be placed at slightly under par.

N. Z. Jubilee.

New Zealand Jubilee.—Capital, £125,000 in £1 shares. This mine hardly deserves special criticism, as explorations, which have been considerable, have not proved the existence of any permanently payable reef. Small sections of good ore have been met with, but it is unlikely that the company will be successful.

N.Z. Talisman

New Zealand Talisman.—Capital, £150,000 in £1 shares. Shareholders in the Talisman Company may take note that, in my opinion, it promises to be a successful mine. But it has not been handled judiciously. Milling was commenced before the mine was sufficiently developed, and with too small a mill, and consequently the best ore had to be picked out to keep up the return. Milling should be stopped at once, and not resumed until the mine has been sufficiently developed to keep fifty stamps at work with a regular, and not a picked, yield. Present developments in a new section of the mine are showing the existence of a reef four feet wide, of which many hundred feet of "backs" must be standing above the present adit levels. Much of this is undoubtedly payable, and a scheme of the most careful and systematic development should be undertaken. If more money is needed shareholders would be quite justified in furnishing enough to have the mine thoroughly developed and fifty stamps erected. They should also insist on having a satisfactory scheme for the metallurgical treatment of the ore decided on before crushing commences; the present treatment of the ore is not satisfactory. With good management the Talisman promises to become a successful mine.

Waihi.

Waihi.—Capital, £320,000 in £1 shares. Reserve fund, £30,000. The Waihi is undoubtedly one of the greatest gold mines of the world, and in Australasia is probably surpassed only by the Mount Morgan (Queensland) and Associated (West Australia). The mine consists of two main lodes, the "Martha" and the "Welcome," with several offshoots from these. The lodes have been proved payable for a distance of 2,000 feet along the level, which has been the most developed, and there is no reason to think that the payable stretch of ground will become shorter in depth. The aggregate width of the reefs and offshoots is probably at least thirty feet, and a surprisingly large per-centage of the whole of the ore ever exposed in the mine is actually payable. At the time of my visit, a cross-cut from the shaft at the bottom of the mine, about 440 feet deep, had just passed through the different reefs. The aggregate width of ore exposed was about eighty feet, and of this no less a width than forty feet was reported to be payable. There is no doubt that shareholders can to-day reckon upon 1,000,000 tons of payable ore in sight, or eleven years' work on the present basis of output. Such figures as these cannot be improved by criticism. Some important problems have to be dealt with by the manager and directors of the Waihi. To begin with, the crushing capacity of the mine is only 7,000 tons per month. This is utterly ridiculous for a mine like the Waihi, which cannot be considered as working at its full capacity until

J. J. Potter, Photo., Mount Eden.

STOPE IN WAIHI MINE.

it is turning out at least 20,000 tons per month. In other words, the present 190 stamps must be at once increased by 210 more, making 400 stamps in all. Four hundred stamps crushing dry, as at present, and allowing for heavier stamps being erected, would crush about 17,000 tons per month; on a large output such as this, the ore would not be picked so carefully as it is at present, and by the inclusion of lower grade, though still payable ore, the present yield of 62s. per ton would be reduced to, say, 48s. Total costs would not exceed 22s. Thus, the yield would be:—

Future prospects.

17,000 tons, at 48s. per ton	£40,800
Total costs, at 22s. per ton	18,700
Monthly profit	£22,100

or £265,200 a year, from which a dividend of 75 per cent., absorbing £240,000, might be paid.

The shares would then stand at £7 or £8, even without the prospect of a still further increase in the output, which, if the mine continues to develop as at present, will some day reach £50,000 per month.

Waihi must introduce wet crushing.

The next problem to be considered is the probable perfecting of a wet-crushing process. When this is introduced a much greater tonnage will be treatable by the same number of stamps, and working costs will fall to well under £1 per ton. Considering the success achieved by the Crown Mines, treating with direct cyanide solutions, it seems more than probable that this process will, too, be found successful at Waihi. The ordinary wet treatment has been tried, but the gold is so exceedingly fine that it floats away on the water. We may look forward with interest to the introduction, at no distant date, of wet crushing of some sort or other at Waihi. The remaining problem for consideration is the treatment of the sulphide or mineralised ore which will certainly be met with in depth. Already some of this class of ore has been found, and a dump of several hundred tons, of very high value, lies at surface, awaiting suitable treatment. This sort of ore will have to be crushed in any case, whether wet or dry, so that no excuse can be offered under that head for any delay in erecting the additional 210 stamps. It will be years yet before any urgent necessity for treating sulphide ore arises, but its treatment should be experimented on and decided as soon as possible. Finally, with regard to the management of this great property :—The equipment of the mine, which includes a very powerful pump, is thoroughly efficient, and the underground work is well carried out. The crushing and cyaniding of the ore is also well organised. The management, generally, is sound, but the general manager must not be satisfied until the Waihi demonstrates to the world its claim to be reckoned as one of its great mines, *i.e.*, with an output approximating to £50,000 per month. The following table shows the progress of the Waihi from 1890 to date :—

YEAR.	NUMBER OF TONS OF ORE TREATED.	ACTUAL AMOUNT REALISED FROM SALES OF BULLION.
		£
1890	*	21,112
1891	*	23,935
1892	18,236	44,888
1893	19,805	61,900
1894	24,864	82.827
1895	35,765	120,334
1896	36,937	137,321
1897	40,768	144,040
1898	73,571	228,415

Waihi Grand Junction.

Waihi Grand Junction.—Capital, £110,000 ordinary, and £40,000 preference £1 shares. This is the only mine that contains the extension of the Waihi reefs, the other mines of the district having no connection with the premier mine. The Waihi Grand Junction owns the ground at *each end* of the Waihi mine, and as the latter company has proved payable ore to within 600-800 feet of each boundary, the speculative value of the Grand Junction is evident. As yet (October, 1898), no definitely valuable discoveries have been made. On the north-east block the shaft is down 500 feet, and a cross-cut from it, just as it was getting into the reef formation, cut heavy water. Until a new pumping plant can be erected, this section cannot be proved further. The reef is certainly there, as it was got in a cross-cut at a shallower level, but so far it is of unpayable value. On the south-west block, known as the Waihi West, a shaft is sunk within thirty feet of the Waihi boundary. At 200 feet some exploration has been done on the reef; it is somewhat broken and is irregular in value, but some of the assays have been distinctly payable. This shaft is too near the boundary of the property to be of much value either for proving the existence of the reef or for developing the mine satisfactorily. I am of opinion that the directors of the company are acting unwisely in attempting to work this mine on their own ideas. The manager's policy for development, not *their* policy, should be carried out, especially in the matter of pumping gear, for the want of which operations were almost at a standstill. On the whole the Waihi Grand Junction must be considered a good speculation, and although it must not be assumed that it is yet proved payable, shareholders are justified in pursuing an active policy of exploration.

Waihi Silverton.

Waihi Silverton.—Capital, £60,000 in £1 shares. Forty stamps are crushing at this mine. The monthly output is about 1,000 tons, for a yield of about 28s. per ton; this yield is not a payable one. The reef is a well-defined body, from eight to ten feet thick, and the best chute extends for a length of 500 feet. The third and fourth levels are now being driven. It is unlikely that this mine will improve in depth, and the future is very doubtful.

Union Waihi.

Union Waihi.—Capital, £141,250 in £1 shares. A great deal of exploration has been, and is still being, done in this mine on several reefs. The results are unsatisfactory. Payable patches have been met with here and there, but not enough to warrant the expectation that the company will erect a battery and crush regularly. The future is still to a certain extent problematical, but the chances are that the mine will be finally proved a failure. The Waihi Company is the principal shareholder.

Waitekauri.

Waitekauri.—Capital, £200,000 in £1 shares, and 30,000 £1 reserve shares against a debenture issue. The history of the Golden Cross section of the Waitekauri, on which all the company's operations are now concentrated, is peculiar. The intermediate level was extremely rich, and on returns from here the shares went to a high figure. Then the No. 1 level was poorer. No. 2 level was driven and proved to be again very good. While the mine, in 1898, continued to develop excellently, the shares kept falling on returns from No. 1 level, the shareholders evidently not having faith in the better prospects of the mine. When this mine was inspected (September, 1898) the position was as follows:—

No. 1 level reef proved payable for 1,000 feet in length, and north face of drive still going through payable ore; this level has turned out better than was expected.

No. 2 level proved payable for 520 feet, and north drive still going through good ore. This promises to be a longer and more valuable level than No. 1. The reef throughout both these levels is a regular body, and averages about ten feet thick, thus exposing a large ore reserve. The cross-cut to No. 3 level had fifty feet to go, but already the face of the drive was in good-looking rock; this fact, together with the state of the reef at No. 2 level, argues well for the value of No. 3 level, and indeed for the future of the whole mine, as depth is attained.

[Since then the reef has been cut at No. 3 level, and is developing very well indeed.]

The ore being treated was yielding 63s. per ton, which, of course, left a handsome profit. There are fifty stamps, ten at the mine driven by water, and forty, five miles distant, which can be driven by either water or steam. In view of the large ore reserves and the promising condition of the mine, the forty-stamp mill will probably be increased to sixty, and later on thirty more will be put up, making 100 in all. The mine can easily furnish the 5,000 tons of ore a month required by 100 stamps. The management of the mine is sound in its various departments, and a probable early introduction of wet crushing will considerably reduce expenses. The ore at present has to be kiln-dried before it is crushed, and this process, by semi-roasting the ore, makes it less amenable to a good cyanide extraction; hence the great necessity for a satisfactory wet-crushing process.

While it would be difficult to forecast the future profits of the Waitekauri, shareholders may take it for granted that the mine is a most promising one, and may expect their shares to see a considerably higher price (say £2) before very long.

Waitekauri Extended.

Waitekauri Extended.—Capital, 333,000 shares of 10s. each. This company's reef has no connection with the Waitekauri reef, but it presents an interesting problem nevertheless. The reef is from twenty to thirty feet wide, and has been proved on several levels, for a considerable distance. The ore, in fact, is unlimited. The mine manager stated that large patches of this ore assayed up to 30s. per ton; that it was easily treatable by wet crushing, and that a test crushing of 400 tons, then being put through, was actually yielding 30s. per ton.

While not assuming that the mine *has* been proved a payable one, it certainly deserves the closest and most exhaustive sampling as a big, low grade proposition. Should the ore prove payable in bulk, and amenable to wet crushing, the mine, owing to natural facilities of gravitation, to the presence of fuel, timber, and water, to say nothing of the immense size of the reef, might become a valuable property. A bad policy is, however, now being carried out by the company; its money has been frittered away in the erection of a small battery, some distance from the mine, and in the construction, first, of a tram line, and then of an aërial tram, between the mine and the battery. All this before the management knows whether the mine is actually payable. What should have been done was to have developed the reef and had it systematically sampled over and over again, and the metallurgical treatment decided on. Then, if found payable, a big battery should have been erected *at the mine*, driven by steam. As it is, for all the money spent, the mine has not yet been proved payable, and the directors and manager cannot have the least idea of how it is likely to turn out. Nor has a satisfactory method of treating the ore been decided on; in fact, it is a toss up whether the mine will ever emerge successfully from its present unsatisfactory position.

Woodstock.

Woodstock.—Capital, £150,000 in £1 shares. The Woodstock mine adjoins the Crown Mines and Talisman, and works the same class of reef as do those companies. The mine shows evidences of having been badly handled. To begin with, crushing was commenced too soon, and the best ore was picked to keep up returns. The metallurgical treatment of the ore, too, was faulty; one method after another was tried, without success, and before the mine closed down, the company had earned an unenviable reputation among mining men. On renewed operations, in the latter half of 1898, the metallurgical treatment was again changed, wet crushing and concentration by frue vanners being tried. As regards the mine it is insufficiently developed, the best ore has been picked out, and it will take a lot of systematical development before fair average returns can be looked for. The reef, while neither being so regular as the Crown nor so good as the Talisman, ought certainly, with good management, to become payable. Shareholders should endeavour to place a practical mining man on the London Board, especially, if, as seems probable, they are to be called upon to furnish further working capital.

West Coast of South Island.

The West Coast of the South Island has been an important mining centre in the past, and in the shape of alluvial digging, hydraulic sluicing and quartz reefing has produced nearly one-half of the total gold found in New Zealand. In recent years all these departments of mining have fallen off considerably. Alluvial digging has practically ceased; quartz mining is limited to the Reefton district and to half a dozen mines. The hydraulic sluicing industry is still fairly prosperous. It is entirely in the hands of local companies or syndicates, and is supported to a considerable extent by Government. The richest sluicing areas have been worked out; but there are still large tracts of country carrying the seams of alluvial wash, to get at which whole hills are sluiced away and the face of the country completely changed. The initial outlay for a sluicing company consists, almost entirely, in the construction of a water race, which shall carry enough water, and have enough fall to hurl, through several five-inch nozzles, 50 or 100 cubic feet of water per second against the face which has to be sluiced away. Then sand, boulders, and water, are carried away down a race, which is fitted with a false bottom, through the seams of which the specks of gold fall and are collected. There undoubtedly remain large areas of country which will pay for sluicing, but the construction of water races, the lower ground having been already worked, has become an undertaking beyond the financial capacity of the local companies, and it is possible that English capital will be asked for for a number of such undertakings. Provided that such companies are not watered by vendors' shares, they may be considered justifiable ventures.

Consolidated Gold Fields of New Zealand.

With regard to the quartz mining at Reefton, the principal explorations being undertaken are on behalf of the Consolidated Gold Fields of New Zealand, a company with an issued capital of £225,000 and a 6 per cent. Debenture issue of £50,000.

This company was formed to take over a number of mines which, in the hands of local companies, had been for a time successful, but which at the time of the flotation of the Consolidated Company, either owing to broken ground encountered, or lack of capital for their proper equipment, had fallen on evil days. The Consolidated Gold Fields is by right, therefore, an exploration company, not a gold mine, but as it is connected more intimately with the developments of mines than any other exploration company in New Zealand, an account of it will not be out of place. Of the various mines acquired by the Consolidated Company, three have already been floated as subsidiary companies, and several more are being developed with a view to flotation. The present company appears to have spent its large working capital injudiciously—trying to do too much at once. The consequence is that £50,000 had to be borrowed recently on debentures, while another £150,000 will certainly be required to bring the mines now being developed to a fit state for flotation. Of the unfloated mines the blocks known as the "Golden Fleece" and "Wealth of Nations" may possibly again be found payable when developed in depth, but a large sum of money will have to be spent on each mine to determine this. Of the three floated companies, the shares held by the parent company are as follows :—

Subsidiaries.

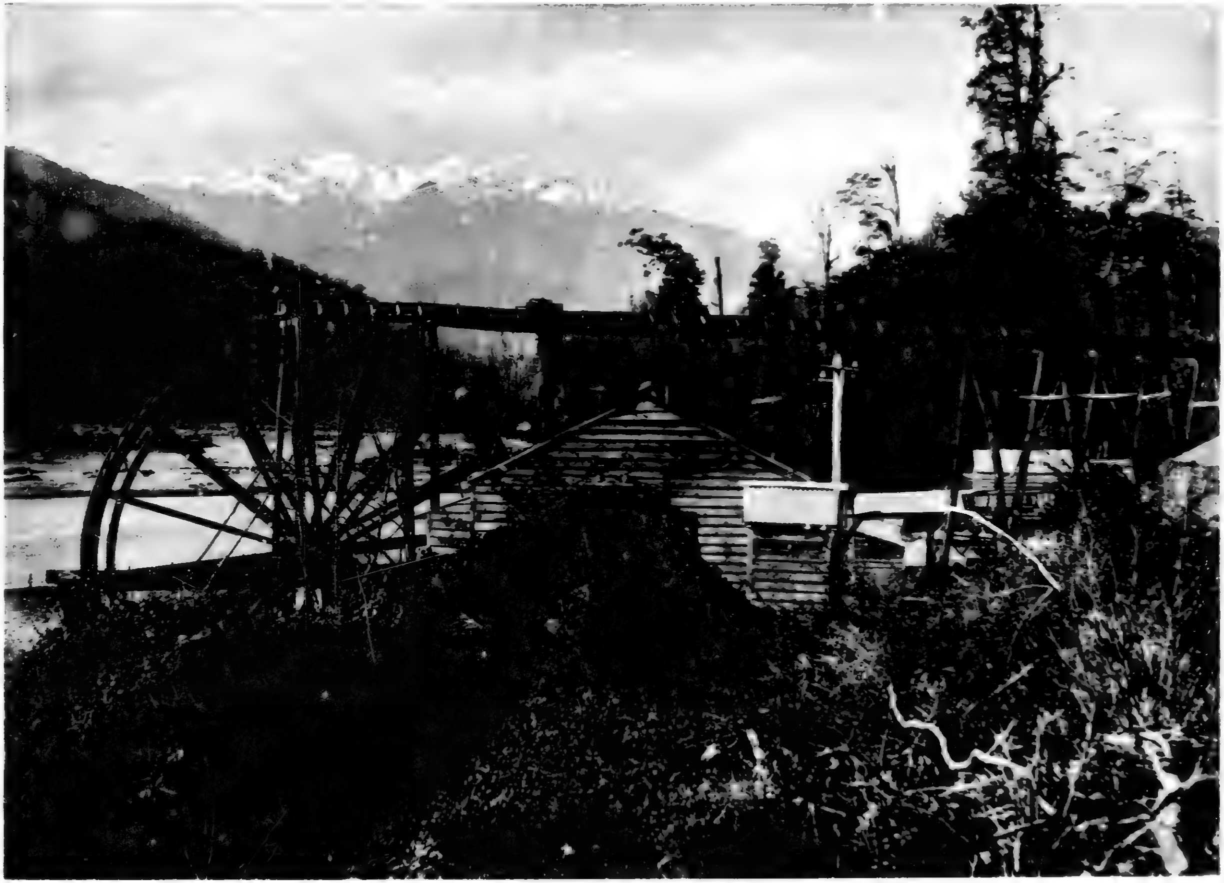
Progress Mines	214,000 out of 250,000 £1 shares.
Welcome	90,000 out of 110,000 £1 shares.
Humphrey's Gully Sluicing ...	90,000 out of 140,000.

To summarise :—The asset of Progress shares is of first importance to the Consolidated Company : the remaining mines are speculative, but after large additional expenditure may become successful. At present the speculative value of the Proprietary Company's shares may be placed at rather under £2.

As regards the subsidiary mines :

Progress Mines.

Progress Mines.—Capital, £250,000 in £1 shares. This mine was taken over from the local company which was working it, while still in a satisfactory condition. In depth it was found to improve considerably, both as to the size of the reef and the length over which it is payable. The reef is eight feet thick, and is an exceedingly well-defined, nice-looking body of ore ; it is wonderfully regular in value ; there are 250,000 tons in sight ; and the lowest workings in the mine show most favourably. The new equipment, both in the mine, and on the surface, leaves no room for improvement, in fact, it is one of the best bits of mining work I have ever seen. There are sixty stamps, of which twenty are old, light stamps, and will be



OLD BATTERY AT PROGRESS MINE, SOUTH ISLAND, N.Z.

replaced by heavier. Owing to the wideness of the reef, abundance of water, and to the easily treatable nature of the ore, the total working costs will not exceed 18s. per ton. A summary of the mine's probable yield is as follows:—

60 heavy stamps will crush ...	3,300 tons per month
Yielding at 37s. per ton ...	£6,100
Total costs, at 18s. per ton ...	2,970
Leaving a monthly profit of ...	£3,130

or £37,560 a year, from which a 12 per cent. dividend, absorbing £30,000, could easily be paid. Eventually more stamps will be erected, and the dividend may reach 20 per cent., but on the foregoing basis the shares should prove a sound investment for years to come. The shares are intrinsically worth 30s.

Welcome Mines.

Welcome Mines.—Capital, £110,000 in £1 shares. Practically no work has been done on this mine since it was taken over from the local company which had previously worked it at considerable profit. There is little ore now in sight, and deeper and extensive explorations, costing a large sum, will be necessary before the mine can be re-started on a profitable basis. A large cash outlay is imperative, but the future is still doubtful.

Humphrey's Gully.

Humphrey's Gully Hydraulic Company.—Capital, £140,000 in £1 shares. This company owns a large sluicing area, the face of a hill, several hundred feet high, being already exposed by old sluicing works. The alluvial is distinctly low grade, but it has been carefully sampled, and the manager estimates that if a sufficiently large head of water can be secured, regular profits will be made. The company has a working capital of £40,000, of which from £25,000 to £30,000 is now being spent on the construction of a water race. It is estimated that £1,200 per month profit will be made; this figure, considering the unreliable nature of alluvial ground, cannot be considered as a sufficient profit when the large capital of the company is considered.

Apart from its large capital, however, the prospects of the mine are fair.

New Inkerman.

New Inkerman Mines.—Capital, £200,000 in £1 shares. The New Inkerman forms an interesting mining problem. Its facilities for cheap working are unrivalled in New Zealand: it possesses natural gravitation, together with water, mining timber, and good coal, all found on the property. The ore is free milling, and no cyanide treatment is necessary. There is an enormous reef, or series of reefs, cropping out on the mountain side, and covering several acres—this only requires quarrying, and probably the total costs of working would be well under 15s. per ton. The one vital fact to be considered, then, is the value of the ore, and on this point the manager was extremely reticent. It is quite certain that the ore is very low grade, but it must be borne in mind that ore yielding 5 dwts., or £1 per ton, would pay well to work. A trial of 60 tons, made in 1896, gave 36s. per ton, but no such high yield as this can be expected with a big mill. It will probably be found, when the manager comes to finally estimate the value of ore reserves, that the bulk of the ore is barely payable, but that a sufficiently large quantity will be found giving a return of £1 per ton, to justify the directors asking the shareholders for sufficient cash to erect a mill of 100 stamps, and equip the mine on this basis. Already a low level tunnel has been driven into the hill for 3,000 feet, in order to find whether the reefs exist in depth, but they had not been picked up at the date of my visit. The chances are that they have narrowed down very much in depth, but the great masses of ore lying near the surface, and covering several acres, would largely neutralise any such occurrence. At their present price of a few shillings, New Inkerman shares may be considered a reasonable speculation.

Some distance to the north of the West Coast district, situated in different localities, are the **Collingwood, Ravenscliffe,** and **Taitapu Estates** mines. None of these have found permanently payable ore so far, and they may be dismissed without remark.

Otago.

The last gold-mining district to be dealt with, and the most southerly, lies in the province of Otago. Scattered over this district are some English mines, none of which are of much importance. These are :—

Blue Spur and Gabriel's Gully,
Achilles,
Otago Syndicate,
Glenrock,
Cromwell,
Island Block,
Premier,
O. P. Q.,
Phœnix.

None of these mines have earned steady profits with the exception, perhaps, of the Blue Spur, which, as a hydraulic sluicing mine, pays a small dividend. The Glenrock and Achilles have occasionally earned small profits. The Cromwell and Island Block are let on tribute. The others are being developed. None of these are mines in which to speculate.

Dredging in Otago.

The most important mining industry in Otago, and one which is increasing in extent, is the dredging of the river beds for gold. This is accomplished by means of ordinary dredges built in Dunedin, and of which there are about eighty now at work. The yield varies from practically nothing, in the case of the poorer stretches of river bed, to a few grains per ton. The companies are all local, and have capitals varying from £2,000 to £10,000. The combined output from the dredges is about 10,000 ozs. per month.

Summary.

The English floated mines in New Zealand, which have now all been referred to, number eighty-nine, and are distributed over the different districts as follows :—

Coromandel	31
Thames	13
Upper Thames ...	30
West Coast, etc. ...	8
Otago	9
Total ...	89

Of these eighty-nine mines, and putting sentiment strictly aside, there are only sixteen which I feel justified in drawing special attention to. Nearly all of the remaining seventy-three mines will eventually be liquidated. Shareholders in these latter will no doubt be asked, in a number of cases, to find further working capital for exploration, but unless the manager of the mine in question can give satisfactory reasons—facts, to justify his request—such moneys should *not* be provided. As regards the sixteen mines, they will be dealt with under the head of "Conclusion."

Management.

With regard to the general management of their affairs, the gold mines of New Zealand betray, to the practised eye, exactly the same features as characterise the conduct of mining in the other countries to which the "boom" spread. To begin with, the mines were floated during a period of financial excitement, and with directors, who, entirely deficient in the important qualifications necessary for such a post, were only anxious to make money. The development of the mine, or the erection of machinery, was to them only important in so far as it added a glamour to the specious market value of the shares. They soon found that the readiest way to add still further market value to the shares, was to announce that a large battery had been ordered and was in course of erection. This did not imply that the mine could maintain a large battery, or even that the mine was payable at all, but the public, anxious for any excuse to gamble, assumed that it did—which was the same thing. The mines were therefore developed in a more or less slipshod manner, and were neither systematically nor carefully sampled, while the manager's chief attention, and an appallingly large amount of the cash at the company's disposal, were devoted to costly water races, aërial trams and batteries, with all the additional expenses which their construction implies. All that, of course, is past; the bubble has burst, but the directors and some of the managers are just as unequal to deal with the affairs of their mines in real adversity as they were in a time of fictitious prosperity. Funds are alarmingly scarce, but even what remains are not used to advantage. Nobody, neither managers, directors, nor shareholders, know the real value of even rather promising mines such as the Woodstock, Talisman, or Waitekauri Extended, although these mines have been floated for several years, and have long since been prematurely attempting to turn out regular returns. What well-informed outsiders *do know*, however, is that these mines, together with dozens of others, have spent large sums upon water races, aërial trams and batteries, sums which would have been of incalculable value if laid out in systematic mine development and preparations for an eventual output, but which are now only monuments to the rapacity of several hundred elderly gentlemen in London.

Metallurgical methods are bad.

Among mining men in New Zealand the most surprising difference of opinion exists as to the metallurgical treatment of the ore. This is hardly a subject of much interest to laymen, but it may be touched on briefly. Of course, in different districts the nature of the ore varies, but the different processes of extraction in localities near to each other are so extraordinary as to merit description. For example:—At the Woodstock, Talisman and Crown mines, all working reefs in the same hill, and probably of the same nature, the treatment of the ore is by wet crushing and concentration; dry crushing and cyanide; and wet crushing by direct cyanide solution, respectively. At Komata Reefs, Waihi, and Waitekauri, all within a few miles of these former, the treatment is by wet crushing, amalgamation and cyanide; dry crushing and cyanide; and both wet and dry crushing and cyanide, after previous semi-roasting. In fact, there are considerable variations of treatment in all these six mines, and nearly every known process of metallurgical treatment is adopted. There is no doubt that the metallurgy of the colony is in a dreadfully backward condition, entailing great additional expense on shareholders, and a commission of enquiry should be appointed, by the mines interested, to sift the matter thoroughly. In the meantime, New Zealand offers splendid opportunities to able chemists and metallurgists, as it also should, if managers knew their duty, to skilled mine samplers and assayers combined.

Conclusion.

The best shares to buy.

And now, as to the sixteen mines which the investor or speculator may take account of without undue risk to himself. Firstly, there is **Waihi,** splendid, unique—the shares will certainly go to a big figure some day, and are a first-class mining investment. Secondly, as proved mines with safe futures, come **Crown Mines** and **Progress**. These mines will not pay large dividends on their capitals, but they are sound ventures, and as such are classified. Following these comes **Waitekauri,** a mine with, apparently, a fine future, which, with another year's development, may be included with the thoroughly proved mines. The value of the foregoing shares on present developments has previously been indicated. Fourthly, lower again in the scale, are three mines which promise well, but which have not yet, owing to causes explained, been developed in a manner which leads to their accurate valuation ; these are **Woodstock, Talisman,** and **Consolidated Gold Fields of New Zealand**. Fifthly and lastly, is a list of mines which are *speculative*, pure and simple, their possibilities estimated by the order in which they are placed in the list, and most of which are likely to experience periodical fluctuations in the share market :—

Waihi Grand Junction,
New Inkerman,
Kauri Freeholds,
Komata Reefs,
Royal Oak,
Tararu Creeks,
Thames Hauraki,
Waitekauri Extended,
Waihi Silverton.

After all, we must consider that these sixteen mines furnish a fairly sound backbone to the gold-mining industry of New Zealand, irrespective of the large number of failures. Valuable mines, no doubt, remain undiscovered. The local sluicing industry, and especially the dredging in Otago, is doing well. The general output is steadily increasing. For 1897 it was £1,001,076 ; in August, 1898, it was £133,522. It seems probable that a somewhat higher yield than this will, before long, become regular, and that, gradually getting rid of the "boom" and its unworthy associations, a sound industry may be built up.

CHAPTER VIII.

THE GOLD MINES OF BRITISH COLUMBIA.

Introductory.

CONSIDERABLE difficulties present themselves to one who would write a summary, in a really lucid form, of the Gold Mines of British Columbia. To begin with, although that country has been so much written about, and rightly eulogised as a great mining area, it is as much on account of its coal, silver-lead, and even copper mines, as of its gold mines pure and simple, that the colony has attained prominence. Again, although alluvial gold has been worked in the province since 1858, it is only within the last five years that even the oldest of the known reef mines have been regularly worked, and by far the greatest number of gold reefs already discovered have not yet passed out of the hands of the prospector or the small syndicate. In other words, the capacities of British Columbia as a gold producer are almost unknown, and it will be at least five years before an accurate estimate shall have become possible. In the meantime, it may be said that it is highly probable that the country *will* become a great gold producer. The southern portion of West Kootenay is, without doubt, one of the great mineralised areas of the world; it contains silver, lead, zinc, copper, and gold, all over its area, either separately or in combination, and although of these minerals, up to the present, silver has been most readily found in payable quantities, and has yielded the best aggregate results, there is strong evidence on all sides to show that gold will, in the course of a year or two, form the principal factor in West Kootenay's output. In many other localities too, in small isolated camps, spread over the immense area of the province, or on the islands lining its coast, gold, although it is seldom actually found

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NOTE C.—The British Columbia mines were visited in October and November, 1898.

free from silver or copper, promises to become the dominant mineral in the future.

With all this it must still be remembered that the gold-yielding possibilities of British Columbia, the profit-earning capacities of its various classes of ore, or of the different companies already floated in the colony, are practically unknown. The immense majority of the reefs are admittedly low grade, and usually of a highly refractory nature; but, on the other hand, they are practically untested, and the treatment of refractory ores in a new country can be constantly modified and cheapened as experience of their nature is gained. The most disappointing matter in connection with British Columbia is the fact that the great majority of the proved and producing mines, and nearly all the prospects, are in the hands of Canadian and American shareholders; nor is there much probability that English capital will ever benefit here, however prosperous be the future of the country, to the same extent as it did in South Africa, West Australia, or India. This applies equally to gold as to other mines in the province. Between Canadian or American methods of mining and finance, and those which *ought* to prevail in the English mining world, a great gulf is fixed. The American uses a mine purely as an excuse for share gambling. If it is a good mine, so much the better; others will be induced the more readily to buy his shares at the fancy price he sets on them. As to dividends, or legitimate profits, he does not want them. A monthly profit of many thousands of dollars is embarrassing. It places a definite value on the shares, and they cease to fluctuate or to go higher: then he feels that his interest in the mine is at an end. The American plays for a coup. If he handles a mine, or a big block of shares, he must either win a big sum, or nothing. He takes no account of a moderate profit.

Local methods of flotation.

The capitalisation of locally-floated British Columbian mines is carried out in accordance with such tenets. A few speculators meet together, secure a name for their mine, and issue 1,000,000 $1 shares. Of these, they divide among themselves, perhaps, 800,000 fully-paid. The remaining 200,000, also reckoned as fully

Photo by E. P. Rathbone, Esq.

MINING OPERATIONS near NELSON, B.C.

paid, are set aside to provide working capital, and are known as treasury stock. A mine, generally some worthless "prospect," held by a member of the syndicate, is then taken over. To prospect this it is necessary to have some money. The mine is puffed by the press, and simultaneously the public is asked to tender for so many thousands of the treasury shares at perhaps five or ten cents a share. Sometimes the syndicate underwrites the first batch of shares. After a time a rich strike is made. The papers become frantically eulogistic : the owners are interviewed every day : the shares are easily rushed up to 50 cents, and the big shareholders, at last being able to make their coup, sell out. To do them justice they are plucky speculators. They set a good round price on their shares, and nothing will induce them to sell at anything less. But they might as well be dealing in counters as in share certificates of this nature. The whole proceeding only helps to degrade mining, and to further close the doors of sound finance to one of the greatest and most legitimate of industries. This is, unfortunately, not an over-drawn picture of the average locally-floated British Columbian mining property. Of course quite a number of really good mines have been unearthed in this manner, but these are to-day all over-valued by the public, and it seems improbable that sound English mining men, even to gain an important footing in the country, will be induced to give the large prices demanded by these speculating cliques for their over-rated discoveries.

English floated mines, to date, are disappointing.

Another noticeable feature, one of great significance, is the fact that, although quite a number of companies have been formed in England to operate in British Columbia, these have, in the aggregate, already turned out failures. The reason of this is, doubtless, the fact that the London company promoters, eager to take advantage of the first awakening of English interest in a new mining field, jumped at the first properties offered them, without waiting to study the features of the country, or the credentials of the men with whom they were dealing. A similar series of flotations to-day might be more successful, because the public has developed a more critical knowledge of the country, but as it is, even at this early date, the reputation of British Columbia must have suffered severely from its numerous failures. In summarising the English flotations we gain the following unsatisfactory information :-

> Of the long list of Exploration and Finance Companies floated, only two appear to have acquired assets of real value, while individual bad management and extravagance is very apparent.
>
> Of the group of placer and hydraulic mines floated in the northern districts of Lillooet and Cariboo, none have been successful.
>
> Of the silver mines floated in the Slocan several are known to be undoubted failures.
>
> Of the individual mines floated in West Kootenay, the prospects are, on the whole, fairly good, but the already high capitalisation all-round largely detracts from the merits of the mines.

On the head of all this, a great deal of harm is done to the best interests of British Columbia by the local press, and incidentally by those financial papers in England which diffuse information derived from the same sources. Day by day an astonishing mass of crude, irresponsible gossip, and a great quantity of lies, appear under the guise of accurate mining intelligence. Anybody with a special purpose to serve can, in the shape of an interview, have his views on any given mine printed by the column, while an honest critic, venturing an unfavourable opinion, is fiercely denounced both by the press and the public. The local papers devoted entirely to mining, are quite devoid of criticism, which, in British Columbia, is now a lost art. All of this forms one feature of the American-Canadian mining method: it soon tires and disgusts the English critic or reader, and is likely, in the long run, to add considerably to the barrier which seems destined to divert British capital still more from the country.

With this brief introduction we may now turn to a consideration of the known facts about the gold mines of the colony.

Alluvial and Placer mines in Omineca, Cassiar, Lillooet, and Cariboo are failures.

Alluvial mining commenced in 1858, and up to the end of 1897 the total yield from this source, principally from the Cariboo district, is placed at £11,863,000. Returns from the working of reefs commenced in 1893, with a yield of 1170 ozs., and by the end of 1897 totalled 215,086 ozs., valued at £860,000. The total yield of gold in the province, therefore, to the end of 1897, was £12,723,000. The yield of alluvial shows a gradual falling-off year by year, being at present only a third of what it was in 1870, but it is probable that the overflow prospectors and prospecting expeditions from the Klondyke region will, before long, cover the northern districts of British Columbia in their search for alluvial gold, and thus again add considerably to the output from that source. The yield from reef gold will of course increase largely for the next year or two, but it is a matter of the utmost difficulty to indicate even approximately what figure this will reach.

The northern districts of Omineca, Cassiar, and more especially Lillooet and Cariboo, have been the home of not only the alluvial diggers, but of numerous placer, or alluvial mines, worked by hydraulic sluicing, and usually employing, besides the white overseers, Chinese and Japanese labour. Most of these mines are in the hands of local companies, and a few have been highly successful. The English floated mines of this class, spread over a wide area, comprise the Golden River Quesnelle; Quesnelle River; Cariboo Gold Fields; New Fraser River; Cariboo G.M.Co.; Fraser River Consolidated; Lillooet, Fraser River, and Cariboo; Big Valley Creek, and Cottonwood Alluvial. Although several of these companies have gone to great expense for dams and races to bring in the necessary lead of water, it is to be feared that none of them have been really successful. The few successful hydraulic mines are in the hands of local owners. This would seem to demonstrate very clearly that hydraulic or any other sort of alluvial mines in British Columbia are not sound undertakings for a Limited Company, but rather for an individual, or small syndicate, of men who would give their personal management to the undertaking. Investors should note this carefully.

The Lillooet, Fraser River and Cariboo Gold Fields, a company from its name evidently formed to work alluvial gold, also undertook the development of the Lanark Silver mine in the Kootenay district with disastrous results.

New Westminster district.

In the New Westminister district, embracing the coast line, also on Vancouver Islands, and the other smaller islands belonging to the province, gold has been found in a great number of places, but as yet no payable mine has been opened up. The reefs are usually low grade, or they carry refractory ore, and practically no capital has yet found its way into this district. The fact that the wonderful Douglas Island, containing the Alaska Treadwell, Alaska Mexican, and other American mines, is situated on the same coast, though at a considerable distance to the north, is worth mentioning in this connection.

Yale district

The Yale district, in the south, is highly mineralised, especially in gold, and all the soundest mining men consider that this will one day be one of the important mining districts of British Columbia. I did not visit this area, but was repeatedly informed that the Boundary and Greenwood districts of Yale, which are now waiting for railway communication before being developed, are likely to acquire considerable fame from their gold reefs. Communication by two railways will probably be established in 1899, and as there are an immense number of claims held here, and highly promising "prospects" waiting to be developed, one may expect great activity and probably some valuable discoveries in the Yale district, in the next year or two. The Cariboo mine, a locally owned property, is the only gold mine in Yale which has yet been developed, and worked at a profit. It has paid £50,000 in dividends in the last three years.

Washington State, U.S.A.

Mining men should take note of the fact that the rich mineralised area found in the south of the Yale and West Kootenay districts continues southward into the State of Washington, where many valuable discoveries have been made in the past year or two. It is quite probable, indeed, that Washington will become the head-quarters of gold mining in the

States, superseding California, Dakota, or Colorado, which may now be considered the principal gold-producing States. The most interesting group of mines at present in Washington are those at Republic Camp, viz., Republic, Jim Blaine, Sans Poil, etc., and these mines should always be included in a tour of British Columbia. The city of Spokane is the head-quarters of mining in Washington and is likely to become an important centre.

In the foregoing districts, in Omineca, Cassiar, Lillooet, Cariboo and Yale, all knowledge of the gold reefs they possess and their probable future value when thoroughly prospected, is hazy and inexact in the extreme. There are no facts about these localities, and there are no people, nor any mining bodies in the colony which make it their business to reduce the known data to even comparative accuracy. It is only in the remaining district of British Columbia, and by far the most important—in Kootenay, where a knowledge of the gold-mining industry has so far progressed, that a few facts are ascertainable.

East Kootenay.

Kootenay is divided into two districts, East Kootenay and West Kootenay. East Kootenay is highly mineralised throughout, but is as yet entirely undeveloped, and there are no exact data of any sort as to gold reefs. This district will be opened out by a branch line of the C.P.R., which is now being built, and which will run from Fort McLeod, in the North-West Territories, to Nelson, in West Kootenay. This line will not only open up East Kootenay, but it will tap the important coal deposits at Crow's Nest Pass, in the Rocky Mountains, and allow of good coal, and more especially coke for smelting, being delivered in West Kootenay at 50 per cent. less than the present price.

West Kootenay.

We now come to deal with West Kootenay, the last, but by far the most important mining district of British Columbia. All sorts of minerals are found here. Were we dealing with silver and lead, an interesting account of the numerous rich patches in the Slocan, in which these minerals are found, could be written: as to copper, there is the Hall Mines, a great silver-copper lode, and dozens of promising "prospects" of the same mineral. Gold itself, wherever found in this district, is almost invariably associated with silver or copper, or both.

The principal gold fields in West Kootenay are :—

(1.) Rossland, or Trail Creek.
(2.) Nelson, and reaching from here right down to the boundary of the State of Washington.
(3.) Revelstoke. Little developed as yet.
(4.) Trout Lake. Little developed as yet.

Rossland.

Rossland, first discovered, I believe, about 1890, is an important gold-mining centre, but it is dependent, as so many other districts are, on practically one small group of good mines. The ground for miles all round is floated into companies, but, although there are numerous strong reefs to be met with everywhere, few of them carry payable gold, and it is improbable that more than one or two rich patches will be found outside the already proved central group of mines.

Rossland is a picturesque town of 8,000 or 10,000 people. It is built of wood, and perched on a steep hillside, right up among the fir and pine-clad mountains. Two railway lines wind up the mountain sides carrying machinery and supplies for the inhabitants, and bearing away piled up carloads of quartz to the various smelting works. The town is very flourishing at present, but this state of things will not last for long. The inhabitants, in the true American and Canadian style, are quite prepared to originate a "boom" on the supposition that there are fifty good mines in the neighbourhood, but when it is all over, and they have lost their money, they will find that there are only the six or seven, which are already known to exist, and which, although good mines, already stand at over-rated values.

Facts about the Rossland Reefs.

The principal sort of reef which runs through the mountains adjacent to Rossland, and especially through the Red Mountain, on the lower slopes of which the town is situated, is a vein of pyrrhotite, a combination largely composed of sulphur and iron, and which usually attains to a width of from 10 to 30 feet.

Photo by Carpenter & Miller.

ROSSLAND.

Geologists do not hazard a definite opinion as to whether these reefs are fissure veins, or whether they have replaced earlier fissures. With regard to this an interesting sentence occurs in a recent report on these reefs by the Government Geologist. He says:—"The miners of the district are generally prejudiced in favour of fissure veins, under the belief that they are the only ones which are apt to be continuous in depth. There is no reason, however, why replacement veins, following lines of fissuring, and filled with a material derived from below, though subject to greater variation in volume, should not be equally permanent."

The best evidence so far as to the permanence of these reefs in depth is that of results from the workings of the two deepest mines, the Le Roi and War Eagle, at 700 and 600 feet deep respectively, in which the reefs are found showing no falling off in either size or value.

Pyrrhotite ore, as found at Rossland, carries gold as its principal value, but also, invariably, an appreciable amount of silver and copper. Owing to its heaviness it is reckoned at 9 cubic feet to the ton, whereas most gold ores give from 12 to 13 cubic feet.

Up till the end of 1897 Rossland produced only picked ore, with a value of about $32 a ton as follows:—

Tons treated. (2,000 lbs.)	Yield per ton.			Total value per ton.
	Gold.	Silver.	Copper.	
128,428.	1·46 oz.	1·96 oz.	1·73%	$32·05.

The ore had to be picked owing to the high charges that ruled for freight and smelting, and probably the total costs exceeded, on an average, $20, or 1 oz. per ton.

Working costs at Rossland.

Even now costs are far too high. This is a point which English investors must carefully note, because if costs cannot be reduced considerably any dividends that Rossland mines are likely to pay are hardly worth their notice. *Average* Rossland costs at the present time work out as follows:—(I have taken those of a typical mine, the War Eagle, which is large, well-managed, and has no smelter of its own.)

Dr.		Cr.		
Development, say	$2·00	Value per ton recovered		$23·52
Mining and general ...	3·24	viz:—		
Railway freight on ore ...	·50	Gold ...	$18·90	
Smelters' indirect charges	3·51	Silver ...	1·16	
Smelters' direct charges	7·00	Copper ...	3·46	
			23·52	
Total cost	16·25			
Profit	7·27			
				23·52
	$23·52			$23·52

Costs at a well-managed mine, therefore, are still about 65s. per ton. Of this, development, mining, and general charges are 21s., and freight and smelting 44s. per ton. Little improvement in mining charges can be expected, but the whole system of smelting costs must be readjusted if Rossland is ever to become an important mining centre.

Smelting charges must be reduced or mines will not pay.

It is an unfortunate thing that the only public smelter at the disposal of the Rossland mines has passed into the hands of the all-powerful C.P.R. That company owns the railway from Rossland to Trail, where the smelter is, and owns the smelter as well. Its total charges on War Eagle ore last year were, as we have seen, $11·01 per ton. If the War Eagle, or any other mine at Rossland not owning its own smelter, is ever to pay, smelting costs will have to be reduced as follows:—

Freight must be reduced from 50 cents to 25 cents per ton. The distance the ore is carried is only about 10 miles.

Direct smelting charges must be reduced from $7 to $4·50, or at most $5. Even at this figure a handsome profit can be earned.

Indirect smelting charges must be done away with, and a special, but very much smaller, charge made under this head. These indirect charges are almost invariable among smelting companies in America, but are little short of iniquitous, nevertheless. Indirect charges are made up in the following way:—

(1.) Gold is paid for at the rate of only 95 per cent. of assay value, although practically 100 per cent. is actually recovered.

(2.) Silver is paid for at the rate of 95 per cent. of assay value only.

(3.) Copper, after deducting about 30 per cent. from the assay value, is paid for at the rate of 5 cents per lb., less than half its market value.

(4.) Fines are levied in numerous ways should the ores prove not to be of the particular fluxing quality preferred by the management of the smelter.

All these unfair charges, which might reasonably be covered by a fixed charge of, say, $1 per ton, cost the War Eagle (taking an average example) in 1898, $3·51 for every ton treated. Since the War Eagle commenced work it produced, until October, 1898, $1,679,613, of which no less than $257,883 was literally stolen from it in the shape of indirect smelters' charges.

To recapitulate:—Rossland ores are now costing $5·24 to mine, and $11·01 for freight and smelting—total $16·25. After that, in the best managed mines, profits commence. But I do not know a single mine at Rossland which if fairly worked, on a large scale, will consistently produce ore worth more than this sum, so that, on the face of it, if present working costs continue, no mine at Rossland, unless its ore is unfairly picked, can make a profit. I have stated that development, mining, and general charges cannot be reduced below the average figure of $5·24 which I have taken so that all future reductions must be made in the department of freight and smelting.

How this is to be done, we have already seen, and is summarised as follows :—

	Present Freight and Smelting Costs.	Should be Reduced to
Freight	$ ·50	$ ·25
Direct Smelters' charges ...	7·00	4·50
Indirect Smelters' charges ...	3·51	1·00
	$11·01	$5·75

A saving of $5·26 per ton.

However vital such a reduction in costs is for the future of Rossland, it is unlikely that the C.P.R. or the smelting companies will be induced to lower their charges to anything like the necessary amount.

As a matter of fact it is imperative that the producing mines at Rossland follow the example of the Le Roi and build their own smelter, because if they do not, even such good mines as the War Eagle, Centre Star, Iron Mask, and Columbia and Kootenay, cannot produce ore regularly which will yield more than the average of $17 per ton, which it is now costing the mines of the district to treat the ore.

Investors in England must not be guided by the fact that all ore produced in Rossland up to date has yielded about $30 per ton. I repeat that in every case this has been picked ore : picked not necessarily to deceive, but to allow of a profit over and above the very high costs of production which obtained and still obtain there. The average value for the good mines, worked on a large scale, will be $12 to $16 per ton, and a great deal of ore of this grade will be found, but if working costs do not admit of ore of this value being treated, the tonnage of higher grade ore in any of the mines will be so small that their dividends will not be worth consideration.

This is a distinct statement, and should be carefully noted. The remedy is, clearly, that the mines should have their own smelter: if they do not, their profits will be insignificant, and the district will never attract much notice.

Summary of principal Rossland mines.

Taking the mines of Rossland in detail, we find that the four principal ones, the Le Roi, War Eagle, Centre Star, and Iron Mask, are situated adjacent to each other on the Red Mountain, overlooking Rossland. This patch of ground is highly mineralised, and contains a number of different reefs running in all directions through it, most of which contain payable gold. Close by are several properties such as the Josie, Columbia and Kootenay, West Le Roi, and No. 1, being developed by the British America Corporation, which contain payable patches, but which are not yet proved successes; within a radius of two miles are the Jumbo, Monte Christo, Deer Park, and Virginia, all with patches of good ore, but none of them proved so thoroughly as the four mines of the central group. Beyond this there is not much at Rossland which is likely ever to be successful, and consequently the numerous other mines, nearly all of which are local or American companies, need not be dealt with in detail.

The Le Roi and War Eagle are the only Rossland mines which have as yet paid dividends.

Le Roi.

The **Le Roi** has an issued capital of 200,000 £5 shares, and at the recent reconstruction was furnished with £50,000 working capital.

Under American control the mine paid $995,000 in dividends.

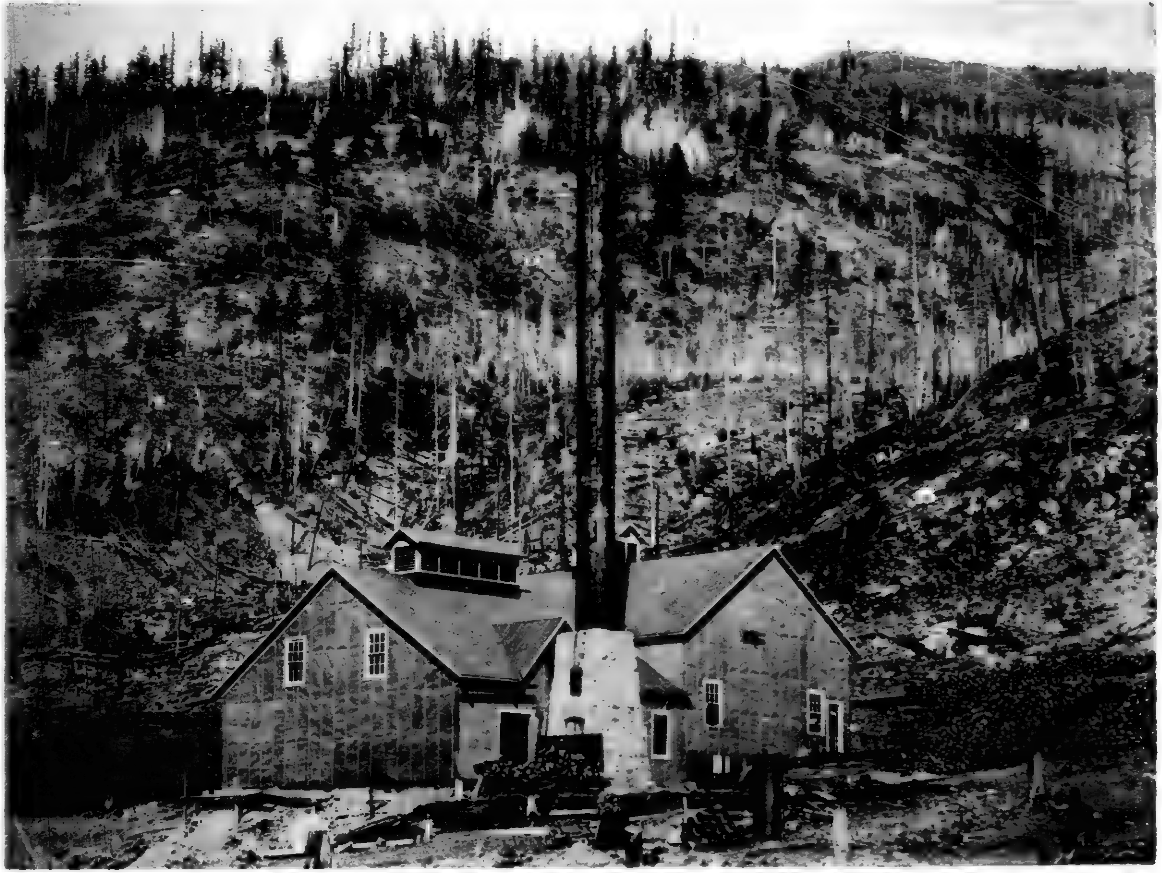
The Le Roi is undoubtedly a very fine mine, much the best in British Columbia: in fact, it may be classed among the great gold mines of the world.

On the principal reef there are several rich chutes which have already been proved to 700 feet deep, showing no falling off in width or value at that depth. The main chute is about 160 feet long, and the width of payable reef in this varies from twenty to forty feet. At the 700 foot level, at the time of my visit to the mine (November, 1898), four drills abreast were being worked through the main chute, exposing an average thickness of twenty-eight feet of payable ore. The future working of the already known chutes, even to a great depth, would seem to be an assured success.

A most important point about this mine is the fact that its full capabilities are as yet unknown. Only one-third of its length has as yet been exploited: there are already immense quantities of low grade ore exposed, much of which will average $10 to the ton. In one place, at the 450 foot level, a cross-cut, driven south for 150 feet, has cut a reef nine feet thick, and assaying, the manager assured me, $15 to the ton. This is the only place in the mine where this reef has been tapped, and owing to pressure of work elsewhere, the discovery has never been followed up, but it shows very clearly the immense capacity of the mine to produce low grade, but, nevertheless, payable ore. I think it more than probable that, during the next two years, so much ore will be discovered in the Le Roi mine, that the future will be absolutely assured for many years. In the meantime, there is, undoubtedly, enough ore exposed to keep the output up to a high level for at least two years.

Under American control, the Le Roi built its own smelter, at Northport in Washington, about eighteen miles from Rossland, and connected by rail, and owing mainly to this fact, was able to mine and smelt its ore at, actually, about 50 per cent. less cost than any other Rossland mine. On the then basis of costs all the $10 ore already exposed in the mine, probably some hundreds of thousands of tons, could have been treated at a fair profit.

But the reconstructed company has, I understand, been floated without the smelter, which presumably has been retained by the British America Corporation. This is a fatal defect. As I pointed out, any mine at Rossland which is expected to pay, *must* own its own smelter. That a great mine like the Le Roi should be put at the mercy of the British America Corporation, however friendly may be at present the relation of the two companies, should not be allowed for a moment by independent Le Roi shareholders. If they do not accept this strong warning,



From a photo by E. P. Rathbone, Esq.

LE ROI.—AIR COMPRESSOR.

they will find that working costs will never return to the old low level, and very probably they will be mulcted in indirect smelting charges to the extent of several dollars per ton, which they will never know about.

Estimated value of Le Roi.

Assuming, however, that the Le Roi again possesses its own smelter, what may be hazarded as an estimate of future results?

To begin with, a new vertical shaft will probably be sunk. The present main shaft goes down through the middle of the main chute, and the mining of thirty to forty feet of rock all round this shaft does not tend to security. There should be no difficulty, with a new shaft, in producing, say, 900 tons of ore a day. This will, of course, be a low grade product compared with all previous results from the mine, but it will be a fair average of the mine, and will yield, say, $14 per ton. The profit will be $5 available for dividend, or £22,500 per month: this is equal to a dividend of over 25 per cent. on the capital. If the management, or more especially the directors, endeavour to work the mine as a high grade mine, and continue to pick the ore, as has been done in the past, they will eventually come to grief; but if they realise that the mine, although one of the great mines of the world, is really a low grade mine and that it *must* therefore be worked on a large scale, with a low average per ton, the mine will become, in all probability, a great and permanent enterprise.

War Eagle.

The **War Eagle mine** has a capital of 1,750,000 $1 shares. It is controlled from Montreal, is well managed, and paid, to the end of 1898, about $400,000 in dividends.

When I visited the mine [NOTE C] preparations were being made to increase the output from 25,000 to 75,000 tons a year. At the lowest level, 625 feet, the reef maintains its average size and value. The chute of payable ore is about 450 feet long; this has practically been worked out to the 275 foot level: below this, the ground stands intact. The reef is about ten feet thick. There are 100,000 tons of better class ore developed, worth, according to the assay plan, $20·50 per ton. It has already been shown that this mine's expenses for development, mining, general, freight, and smelter's direct and indirect charges, amount to $16·25 per ton. The 100,000 tons in sight therefore will yield a profit of $4·25 per ton, or $425,000 in all. In addition to this, there is a good deal of low grade ore in the mine, and the prospects of continued rich ore being found on the main chute in depth are excellent.

Notwithstanding this, the earning capacity of the mine, without its own smelter, is only about $300,000 a year, with eighteen months' ore blocked out, and the price at which the mine is capitalised in the market, $5,000,000, is quite unwarranted. This is an example of the American method of valuation.

Centre Star.

The **Centre Star** was recently purchased right out by Montreal capitalists for $2,000,000, and will no doubt be refloated shortly for a much larger sum. The reef is a continuation of the Le Roi lode, and its highest value is near the boundary line of the two mines. There is an immense amount of ore in sight in the Centre Star, several hundred thousand tons, but mostly low grade. If the mine owned its own smelter most of this ore could be worked at a profit; but as it is, the mine will probably be picked, in the usual Rossland style, and with poor results. As a big low grade mine, the Centre Star would be an undoubted success, but until it is placed on this basis, and owning its own smelter, it is not worth the attention of English investors.

Iron Mask.

The **Iron Mask** is the fourth and last of the leading group of Rossland mines, and is the least developed of the group. It has a capital of 500,000 $1 shares, is controlled locally, and is being opened out on sound lines.

There are several reefs on which payable chutes are found. None of the chutes have so far proved to be of great length, and, as a rule, the reefs are narrower than in the other mines; but the prospects are decidedly in favour of a gradual improvement as developments proceed. The manager estimated that there were 38,876 tons of ore blocked out, worth $623,738. This he analysed into two grades of ore :—

20,360 tons worth $24·08 per ton.
18,516 tons worth $7·20 per ton.

The lower grade ore is unpayable.

Unless the Iron Mask owns a share in a private smelter, working costs will not be less than $17 per ton, and as the output will not exceed 1,000 tons per month for some time to come, no profits to speak of can be expected. Eventually, when much more fully developed, the mine should become moderately successful.

B.A.C. properties.

The **British America Corporation** is not a gold mine, but as it is developing a number of claims at Rossland, which are popularly supposed to be turning out well, a criticism of this Corporation will not be out of place.

The Corporation was floated with a working capital of £1,000,000. A lot of this money was justifiably locked up in a purchase of Le Roi shares, but as to the remainder, the Corporation undertook the purchase and equipment of far too many claims in the district, and at the time of my visit, had to considerably restrict its vicarious operations.

We are, however, not concerned in a criticism of the B.A.C. financial methods, but rather in a survey of its gold claims. Of these, the Columbia and Kootenay appears to me much the most promising. The reef is an immense vein of pyrrhotite, forty feet thick, and driven on, in several levels, for 1,500 feet. Most of this ore is very low grade, unpayable in fact, but there are a number of patches of really good ore in the lode, and as these patches are from thirty to forty feet thick, and probably extend in depth, the chances are that this mine will emerge to a successful, if not a great, future. Of course a large sum of cash will be necessary to equip the property, probably far more than the parent corporation, with its unwise financial policy, has allowed for; a private smelter, too, is a necessity.

The No. 1 claim, another of the Corporation's assets, has proved a small amount of good ore, worth $15 per ton, but it is not nearly far enough developed to assert that the mine will be a payable one.

The same remark applies to the Josie, West Le Roi, and Nickel Plate assets. It is commonly supposed that all of these claims are opening out well, but in no case can it be asserted that any one of these has as yet been proved payable. It is questionable whether the B.A.C. will be able to provide enough cash for the suitable development of these mines, but whether this be the case or no, investors must not assume that any of them have yet been proved actually payable on a fair scale.

Other mines.

As to the Jumbo, Deer Park, Monte Christo, Virginia, which are mines in the neighbourhood of Rossland, that have found small patches of good ore, it may merely be stated that none of these are yet proved successes; that they are all locally owned properties, and therefore at the mercy of the American or Canadian with his exaggerated sense of values, and his love of a non-critical and excessively eulogistic press.

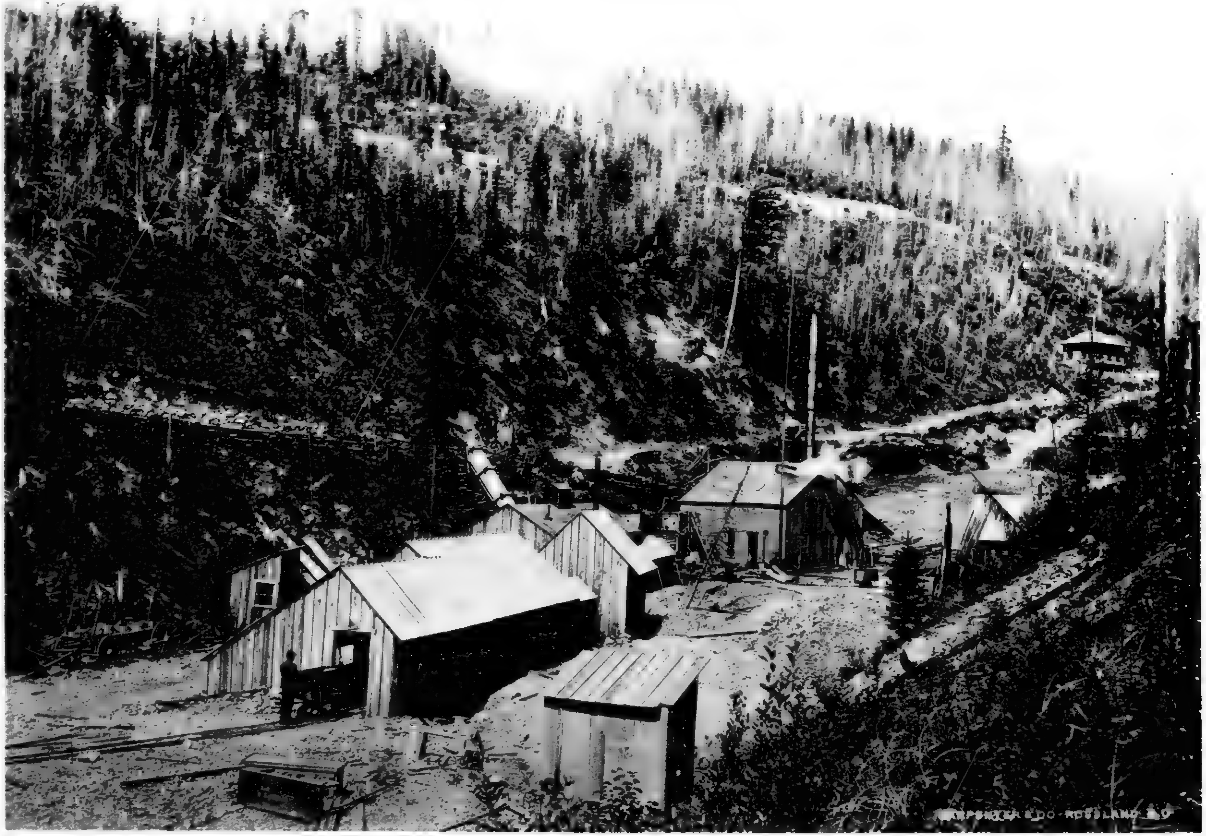
Nelson district.

The Nelson district contains a great number of gold bearing reefs, in which silver, copper, and even lead, accompany the gold; but so far none of these reefs have proved entirely successful. The ore is amenable to amalgamation and concentration, so that working expenses in the Nelson district will always be much less than at Rossland, but to set against this fact is the much lower average value of the reefs.

Ymir—a sound low grade mine.

The best mine developed in the district so far is the **Ymir** (pronounced Wymer), which was recently floated in London with a capital of 200,000 £1 shares.

The reef, situated high up on a mountain side, as are the majority of British Columbian reefs, is of whitish quartz, containing frequent patches of galena and pyrites. The pay chute averages 600 feet in length; the reef is practically unbroken, of an average width of ten feet, and has been opened up along four levels. It is a low grade ore, but is easily mined and



CENTRE STAR MINE, ROSSLAND.

treated, and working costs should not exceed $4 per ton. The average recovery should be about $8 per ton. At the time of my visit [NOTE C] there were about 120,000 tons developed, and a forty stamp battery, to be driven by water power, was being erected. On the lowest level the reef contained sulphide, and showed no deterioration in value or width; there are in fact the best reasons for considering that the chute will be found to continue in depth.

As to the future of this mine: Forty light stamps, driven by a rather meagre head of water, will crush 3,000 tons per month, at a profit of at least $3·50 per ton. This will give a profit of £25,000 a year, and results approximate to this may certainly be relied on for some years to come. The management is sound, and provided the chute continues in depth, as it may reasonably be expected to, the profits may eventually be worked up considerably. The capital valuation of the mine—£200,000—seems excessive, especially for a new undertaking such as this, but there is every reason for considering the Ymir as a really good low grade mine.

Porto Rico.

Near Ymir is the **Porto Rico mine,** belonging to the Canadian Pacific Exploration Company of London. I understand that this mine is developing with some promise. It is not yet floated.

Dundee.

The **Dundee,** a property with a reef carrying gold, silver, and lead, is near here, and has undoubtedly some rich ore, but as yet no great quantity has been exposed. I did not go underground here. The company has a capital of 1,000,000 $1 shares, and these have been introduced on the London market.

Fern.

The **Fern mine,** nearer to Nelson, has a capital of 800,000 shares of 25 cents each, some of which are held in England. The mine is as yet only worked on a small scale, but is earning small profits.

Athabasca.

The **Athabasca mine** has a capital of 200,000 £1 shares. This property is situated close to Nelson. It possesses an excellent ten stamp mill with frue vanners, and a well-erected tram-line from the mine down to the mill. There are two reefs on the property; neither are as yet much developed, but both contain patches of undeniably rich ore. At the time of my visit, there was an aggregate, taking each reef at fifteen inches, of about a year's good ore in sight for the ten stamps. In the lower workings several bad faults cut up the ground, and the course and value of the reefs beyond these is somewhat problematical. On the whole, the mine will probably produce payable ore for ten stamps for some years to come, but the mine is essentially a small one, absurdly over-capitalised, and cannot be recommended to the serious attention of investors. An excellent extraction is secured by milling and concentration.

Nelson Poorman.

The **Nelson Poorman** is a Vancouver Company, which has been worked for a number of years with small profits aggregating $100,000. The capital is 1,000,000 25 cent shares. When I visited the mine, all the payable ore had been worked out, and efforts were being made to trace the payable chutes in depth, in order to develop some more ore. Small profits will probably be realised from time to time, but the mine is, essentially, not an important one.

Duncan Mines.

Duncan Mines.—Issued capital, £116,736. The company was formed to develop several blocks of ground in the neighbourhood of Nelson. The principal claim which I inspected is known as the "Granite." Here a shaft had been sunk seventy-five feet on a quartz reef. Near the surface and for fifty feet down the reef was four feet thick, and averaged 32 dwts. Below that, and all along the level, so far as it had been driven, the vein had pinched out to about two inches thick, carrying little gold, and showing every sign of giving out entirely. This section I set down as being of no value. On another section, the "Canadian," a reef about one foot wide is being opened up; it shows fair regularity but is not of high value. The prospects for the company are not favourable. There are no other English owned gold mines in the Nelson district which merit attention.

Revelstoke district.

In the remaining districts of West Kootenay there is little development to chronicle as yet. Near Revelstoke two English floated gold mines exist—Tangier and Waverley. These do not merit the serious consideration of investors.

Trout Lake district.

The Trout Lake district, between Revelstoke and Nelson, is expected to become successful when transport facilities exist. At present there is a good deal of prospecting here, but no gold reefs of note have yet been discovered.

Conclusion.

In conclusion, it may safely be asserted that a great gold-mining industry will certainly grow up in British Columbia during the next few years. As yet the results from individual mines are, on the whole, not favourable, but the country generally, and even many of the individual mines, are, as yet, unproved, and it would be distinctly unfair to judge the future from such a standpoint. Rossland will become an important centre, provided that the mines erect smelters of their own; Yale, especially the Greenwood and Boundary districts, show distinct promise; and the numerous free milling reefs near Nelson will produce, eventually, a number of sound low grade mines. The group of placer and alluvial companies may be written off as disappointing, but against this is the fact that all over the great area of the Territory prospecting parties are at work, and each year a few more payable mines will be added to what will eventually become a fine aggregate.

CHAPTER IX.

THE GOLD MINES OF RHODESIA.

Rhodesia visited in April, 1899.

At the eleventh hour (April, 1899), I was able to pay a hurried visit of a few weeks' duration to Rhodesia, and although I did not penetrate as far east as Mashonaland, I inspected ten of the principal mines in Matabeleland. This country forms the eastern section of Rhodesia, and, owing to the fact that Bulawayo is now connected by railway to the Cape Colony, is much the more developed area of the two.

The future for mining in Rhodesia is very promising.

I went to Rhodesia firmly convinced that the gold mining operations in that country would result in almost complete failure. I came away, after only a few weeks of inspection, impressed very strongly with the fact that the country is about to become a prominent and permanent gold producer. I see no necessity for incoherent ravings as to the value of the country, but I think myself justified in saying that I consider the gold mining prospects of Rhodesia are *distinctly promising*.

Reasons for previous pessimism satisfactorily disposed of.

My reasons for previous pessimism I will enumerate.

Firstly, all the reports of leading engineers and experts on the country, public or private, which I had ever read, had been either unfavourable or non-committal. The latter style of report is, of course, not supposed to be taken too seriously; but the definitely unfavourable reports of several engineers of ability weighed with me not a little.

It is only due to the writers of these reports to state that they were all compiled some years ago, before any development work had been done—except, perhaps, the clearing out of some of the ancient workings, and that, on the facts which they then had to go upon, their deductions were probably correct.

Secondly, I had conceived the impression, I do not exactly know how, that the depths of the ancient workings determined the extent of the payable ore, and that below these points the reefs would either be found to have pinched out, or to have become almost barren in gold contents. Only occasionally, as a matter of fact, has this surmise proved correct.

Thirdly, I assumed that, as quartz mining in South Africa had always previously been a ghastly failure, whether at Zoutpansberg, in the early days; at De Kaap; at the Murchison; or more especially at the Letaba and at Tati, districts on the very borders of Rhodesia itself, the strong probability was that the quartz reefs of Rhodesia would be also equally treacherous in nature. But I found that the quartz reefs in Matabeleland lie in an entirely different formation to those of any of the other districts enumerated, and it is clear that any deductions under that head are not warranted by facts.

Fourthly, I was struck by the fact that, whereas Mashonaland was occupied in 1890, and Matabeleland in 1893, the total output of gold from these countries up till almost the end of 1898, had been practically *nil*. I think it is certain that a number of the earlier prospected reefs in Mashonaland really proved disappointing; had this not been the case, that country should have been producing gold between 1892 and 1896; but there is no doubt that in Mashonaland, and more especially in Matabeleland, the first war against the Matabele, the 1896 rebellion, rinderpest, scarcity of transport of food and of water, and the general inaccessibility of the country before the Beira and Bulawayo railways were constructed, account very largely indeed for the delay in producing gold.

Estimate as to the future.

Having, therefore, satisfactorily disposed of the doubts about Rhodesia's success as a gold-mining country, which recently possessed my mind, I will venture to predict what may be the measure of success for the country for the next year or two ahead.

Although it is yet only Matabeleland which is producing gold, I was assured, from reliable sources, that the reefs of

Mashonaland and their geological formations are similar to those of the Matabele country, and that it is only a question of development for Mashonaland to become a regular gold producer. I am told that in Mashonaland the Penhalonga, Rezende, Glendarra and Beatrice are all opening out well, besides several unfloated properties belonging to one or other of the exploration companies. As yet, however, little real development has been done in that country. In Matabeleland, besides the four mines which are at work and all yielding profits, are quite a number more, about the eventual success of which there can be little doubt. So far as can be gathered at present, I will venture to hazard the opinion that in, say, three years from now, or at the end of 1902, there will be thirty mines in Rhodesia, either at work or developing, which will be proved payable, and of these, although perhaps half will not support more than 10 or 15 stamps, the remainder may be expected to yield enough ore for from 20 to 100 stamps each.

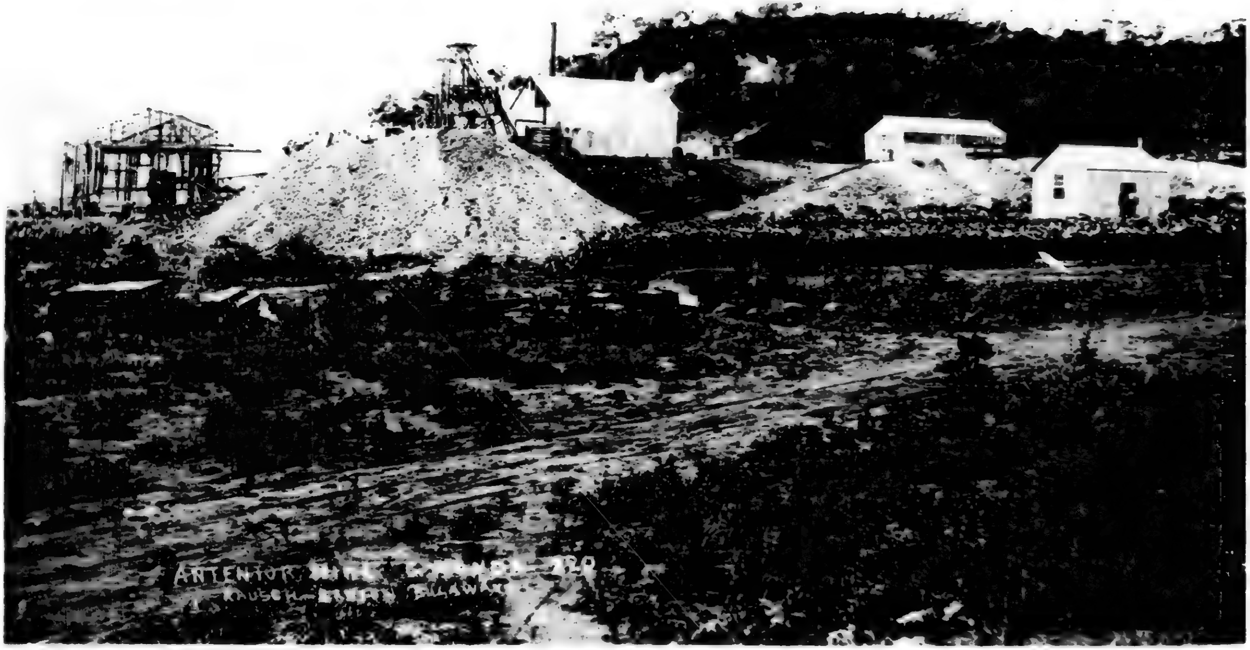
Thirty payable mines at work in 1902.

With a probable prospect such as this in store, Rhodesia is justly entitled to rank in a noteworthy position amongst quartz-mining countries. It is possible that eventually far more than thirty payable mines may be found. There are undoubtedly hundreds of ancient workings which have never yet been prospected by their present owners, and probably, too, in the northern districts of both Mashonaland and Matabeleland, there are old workings which have never yet been found at all.

The old workings described.

The old workings, many of which appear to have been in use within the last two or three hundred years, have proved a wonderfully effective guide to the prospector and to the engineer in Rhodesia.

To begin with, the ancient prospectors, with great discrimination, never wasted work upon barren reefs. To-day these latter may be found cropping out all over the country, and similar in appearance to the gold-carrying lodes. But if no old workings show on these, it may be taken for granted that they contain no gold, or very little. This fact has been



ANTENIOR MINE, MATABELELAND.

repeatedly proved. Again, where the ancient workings on a reef are irregular, taking the form of a series of workings rather than of one continuous stope, the owner would do well to act cautiously, to withhold a judgment of the mines' value until a great deal of work at lower levels had been done, and not to venture a premature flotation. But where the ancient workings continue in an almost unbroken line for over 1,500 or 2,000 feet, the possessor of such ground may consider himself fortunate; there is apparently every probability, such was the perspicacity of those miners long since dead, that somewhere in these workings a wide and payable chute of gold will be discovered, which will live in depth, and on which, after due development, a successful mine may be floated.

All the good mines have been discovered beneath old workings.

I am not aware that any ancient workings, showing continuously for over 2,000 feet, have failed to indicate the presence of a payable mine, and from such sources have been discovered already such standard mines as the Globe and Phœnix, West Nicholson, Geelong, Selukwe, and Bonsor, to say nothing of numerous other mines in course of development.

No work has yet been done in Rhodesia on reefs other than those worked by the ancients, and it is only the most continuous of these workings which have been as yet at all developed.

An adverse critic of Rhodesia may very fairly put forward the theory that the pick of the old workings have been already developed, and that the group of good mines so discovered are really the best in the country, and that future explorations will unearth nothing more of real value. As against this, I am disposed to think that there are already 50 to 100 old workings of unusual size known to exist, and in the vast extent of Charterland new discoveries of old workings will be made for years to come. The large workings already known, and being developed, are enough, however, to produce in three years the thirty payable mines I expect to see, and with such a prospect in store, although duly weighing all adverse criticism, I cannot help looking favourably to the future.

Rhodesian share values are mostly discounted already.

When in Bulawayo, I found that a boom was raging in Rhodesian stocks. As usual, the London market had more than discounted the most favourable anticipations of the future, and many shares which I should have valued, sound though the general prospects of the country are, at shillings, were changing hands freely at pounds.

It seems to me that the several thousand mining capitalists in London who to-day control from that great centre the gold mines of nearly the whole world, have of late years made so much money that the hasty realisation of scrip is now not necessary for them. Consequently, whenever a mine appears to be at all promising, as many of those in Rhodesia are, these gigantic shareowners, already worth more than they know what to do with, simply lock the shares away, and refuse to sell except at the fullest possible valuation.

Reasons for this.

A gold mine rarely starts work to-day with the probable dividend in sight not discounted, in the market valuation of the shares, down to a 6 or 8 per cent. yield. This is absurd—for a Rhodesian quartz mine, extremely absurd—and I must follow this statement up by saying that I consider at to-day's prices almost every mine or exploration company in Rhodesia, although many of these are quite good, is standing in the market at a price rather over than under its intrinsic value.

Exploration and Finance Companies in Rhodesia

Nearly all the unfloated mines of possible value, and practically all the ancient workings in Rhodesia, belong to one or other of the numerous exploration and finance companies connected with the country. As I have stated before, I do not deal with this class of company in this book, and have little admiration for the way in which most of these concerns, wherever I have known them, are conducted. In Rhodesia, these exploration companies hold between them now practically the whole of the ancient workings : that is to say, all the sources from which payable gold may be expected ; also most of the known coal and forest areas, and the best of the agricultural and watered country. For all this, no taxes to speak of are paid to the Chartered Company, no development work to speak of need be done on the reefs, and all the choicest mining and agricultural rights of the country have thus already passed into the control of a few groups of capitalists who will only develop these when the share market permits of flotations being made.

have been benefitted at the expense of the country generally.

Rhodesia is, therefore, no country for the poor man, for the fossicker or for the small farmer. In Australia, if a capitalist wishes to tie up a mining concession, or block of claims, for a period of years, he must employ one man for every six acres held, and do a certain amount of prospecting ; but in Rhodesia, the capitalistic exploration or finance company, practically a concession to commence with, owns its thousands of claims, its hundreds of thousands of acres, and its stretch of river, and by payment of almost nominal fees can allow these to remain unproductive until the state of the London market permits of a season of feverish development.

B.S.A. Company,

As to the Chartered Company, that corporation has not only disposed of many of its best assets to capitalist interests, but by its mining laws has deprived itself of a large and legitimate revenue. A single claim pegged out in Rhodesia entitles the owner to work, to any depth, and in any direction all the ore bodies which crop out in that claim, but which, should they dip at a flat angle, may eventually be found a mile distant. In other words, each claim carries its own deep level, free of all cost ; and whereas in the Transvaal the monthly licences payable to Government on any given mine represent, we will say, 100 claims, the equivalent payable to the Chartered Company is probably not more than the licences on fifteen or twenty claims.

its mining law.

I suppose that if Chartered shareholders agree to all this nobody else has a right to object. The Chartered Company certainly gets a large block of shares on every flotation. The coming years must benefit it considerably from a financial point of view, and no doubt the shares will form an attractive speculative counter, and will rise.

Railways are vitally necessary.

Railways are absolutely necessary in Rhodesia. Those of most importance at present are branch lines from Bulawayo to

Gwanda and Gwelo, and I am glad to see that these are to be built forthwith. A railway to one or other of the great coal deposits will ere long be necessary. This might take the form of a continuation of the Gwanda line to the Tuli coalfields; or a line from Bulawayo to the Wankie district; or, perhaps, more preferably, a continuation of the Gwelo line towards the Zambesi, which, besides tapping the mining district of Sebakwe, would run close to the Mafungabusi coalfield.

Mining facilities.

Fuel.

For four or five years to come there is ample fuel near all the mines, which are mostly located in "bush" country; after that a coal railway will doubtless exist.

Mining timber.

Excellent mining timber is procurable locally in the shape of the Mopani wood, with which a good deal of sound shaft timbering is already being done.

Water.

Water is not plentiful in Rhodesia, but usually a permanent mining supply can be secured at a distance of not more than five miles.

Dynamite.

Dynamite costs 50s. a case in Bulawayo, and delivery at the outside mining districts about 2s. 6d. a case additional.

Native labour.

Native labour is scarce, rather poor, and highly paid. The Chartered Company has forbidden natives within its territory to seek work outside of the country, but the native population in all the southern districts is sparse, and until the great supply of the Zambesi is tapped and thoroughly organised, there will be a decided and continuing scarcity.

Working costs will be low.

Working costs in Rhodesia will average a decidedly low figure.

Dynamite is cheap; there are (as yet) no Customs dues of any sort; the reefs are usually rather wide, and easily broken; the gold is readily recovered by amalgamation and cyanide; native labour, though not really good, is cheaper than at the Rand, and is never vitiated by drunkenness or desertions, as in the Transvaal; good mining timber can be cut without cost; fuel is plentiful; and, finally, the initial development and equipment of the mines, following the scientific standard of Johannesburg, is already far advanced as compared to many older quartz-mining countries.

At the bigger mines, the total working costs, including cyanide treatment, development, and head office expenditure, should not exceed 25s. a ton at the most, and in individual cases should not exceed 21s. or 22s. a ton.

Geology.

The geological occurrence of the reefs in Matabeleland seems to follow no hard and fast rule. Generally, the lodes are found between walls of schistose rock, and, although some appear to be true fissure veins, others lie parallel with the formation, and are therefore contact or interstratified reefs. There is no reason why these should not prove of a permanent nature.

The Geelong Reef lies between schist and granite; and I know of other lines of old workings on a similar formation. There are also reefs lying in the solid granite, but none of these have as yet been found to continue in depth. There is no reason, however, why they should not.

Generally speaking, I should think that most of the best reefs known in the country to-day will live in depth whether they are fissures or stratified lodes, and the continuance of the gold in them seems also fairly assured.

The mines in detail.

Criterion.

Passing now to a description of the mines I inspected, and of others I gained reliable information about, the first to be noticed, and that the nearest to Bulawayo, being only nine miles distant, is the **Criterion**, a subsidiary of Rhodesia, Limited. At this mine about £30,000 has been spent on the development of several parallel reefs, a large dam, a compressor plant, and a general surface equipment. Unfortunately, the reefs are patchy, and while small sections of the developed ore assay highly, the remaining and larger areas are poor. So far as developed, the Criterion is an unpayable mine, and, even under more favourable results than at present, could not keep more than five stamps at work on good ore. The mine itself is being judiciously developed, but much of the surface expenditure appears to have been premature.

Not far from Bulawayo, in south-easterly directions, are the **Matabele Sheba**, and the recently floated **Red and White Rose**.

I visited neither of these mines, but they are supposed, locally, to have favourable prospects.

Gwanda district,

The **Gwanda** district lies about 100 miles S.E. of Bulawayo, and promises, I think, to become the best mining district in Matabeleland. The coach road lies through the Matopo Hills, celebrated as the refuge of the Matabele during the 1896 rebellion, and several graveyards by the roadside, with monuments erected by the Government and people of Rhodesia, tell their own tale.

the most promising district in Rhodesia.

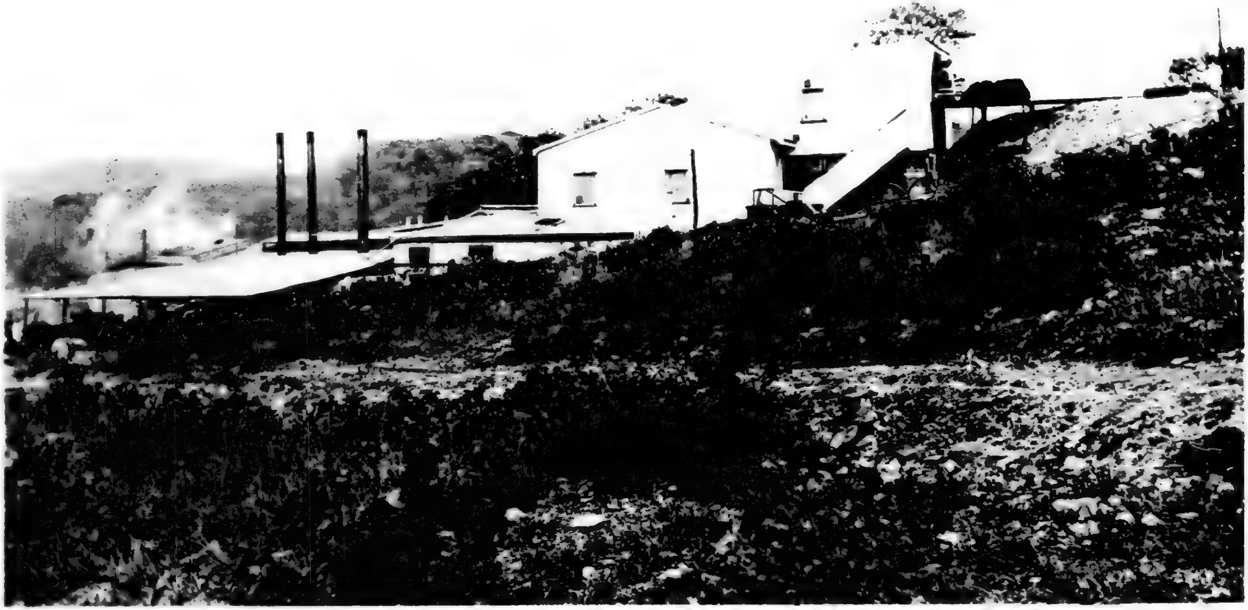
At Gwanda there is thick bush, which will last the mines as fuel for years to come, and near at hand, too, is the Tuli coalfields, with which the railway from Bulawayo to Gwanda will doubtless be connected. There is, too, Mopani wood, for mine timber, and several rivers which yield a continuous water supply. The reefs at Gwanda appear to be of great thickness, and fairly regular in gold contents, while the runs of ancient workings in places continue uninterruptedly for thousands of feet.

The pick of the properties apparently belong to the Matabele Gold Reefs and Matabele Mines Exploration Companies, and I should think that shareholders in these will benefit considerably during the next few years.

A list of mines at Gwanda.

The mines controlled by these companies are Geelong, West Nicholson and Eagle-Vulture, while the following claims which they own are all supposed to be good: Olympus (extension of Nicholson), "Jessie," "Ancients," "Blanket," "Marmion." In addition to these there are also in the Gwanda district the Antenior, the V. V. Gwanda (developing four claims, of which "Australian" and "Imani" are the most promising); the Gwanda Consolidated (with numerous claim holdings), and the "Sabiwa" claim of the Rice-Hamilton Syndicate.

Of the twenty or so properties now being developed at Gwanda, it is probable that quite half will be proved payable, to say nothing of further discoveries which may be made. This favourable prospect, combined with the fact that some of the reefs are of great thickness, justifies my statement that to-day Gwanda is the most promising district in the country.



BATTERY AT GEELONG MINE.

Geelong.

As regards individual mines, **Geelong** has an issued capital of £200,000, and was provided with a working capital of £127,000. When crushing commenced £35,000 was unspent, and this sum will be devoted to the payment for extra stamps, for a cyanide plant, and for additional mine development. The mine is at present soundly equipped with twenty stamps, air compressor and rock drills, complete workshops, and electric light. Water is pumped four miles. The mine lies on a hill in the very heart of the bush, and the electric lights bursting out on a dark night must doubtless cause a passing wonderment to the numerous lions, which, in their state of native simplicity, still inhabit the district.

The reefs.

The Geelong Reef, like so many in Matabeleland, is an ugly, almost-white quartz, and is interbedded between schist and granite. It averages 15 feet thick, and the gold is apparently mixed through the whole of it. The shaft is now down to 500 feet, and in the bottom the reef shows no failing in either size or value. The longest level at present is 800 feet, but old workings show for a distance of 3,000 feet, and it is quite possible that the length of the Geelong Mine may eventually extend for about this distance. The reef dips at 30°, and the ancients worked it in places down to 250 feet. There is a parallel reef, 60 feet distant, which has never yet been exploited, but the existence of old workings on it would seem to indicate that it is of value.

Ore in sight.

The ore in sight, taking a length of 800 feet, a payable width of twelve feet, and a depth of 500 feet, after deducting 50,000 tons extracted by the ancients, gives a total of 320,000 tons. Of this, 16,000 tons had been milled at the time of my visit, yielding (with an estimated return from tailings) about 45s., and I see no reason why the remaining 304,000 tons, taking a twelve-foot stope as against six-foot at present, should not yield 35s.

The estimate of the mine's capacity is as follows:—

There are now twenty stamps, which will be immediately increased to forty. The shaft will be sunk rapidly, and if at 1,000 feet the reef continues of the size and value that it has at 500 feet, sixty stamps more will be erected—making 100 in all. With 100 stamps, total expenses would not be more than £1 a ton, leaving 15s. a ton profit. Estimated profits. This, on 125,000 tons a year, would give a profit of about £90,000 a year. On a 10 per cent. basis—which of course is not enough for a quartz mine—Geelong shares would then have a value of £4 10s. As a matter of fact, the shares stand at this price already, so that shareholders have not only discounted the value of the mine 500 feet below its present bottom, but have shown their willingness to be satisfied with a 10 per cent. investment from a quartz mine in a new country. On a more reasonable basis of capitalisation the Geelong Mine shows every prospect of becoming a sound and permanent concern, and no doubt will one day reach a basis of 100 heavy stamps.

West Nicholson.

West Nicholson.—I could not go down this mine, as, owing to shaft repairing, the mine was full of water. There is, however, every reason to believe that the West Nicholson has a great future before it. The payable ore is proved to be 1,000 feet long, and a series of cross-cuts at the 130-foot level show the lode to be thirty-five feet thick, and worth an average of 16 dwts. Value of ore. This is a startlingly good result. Not enough work has yet been done to verify these figures, but there seems no doubt that the West Nicholson is likely to be one of the best mines in Rhodesia. The lode is thought to be a fissure vein. Ten stamps are being erected to test the ground, but the ultimate milling capacity should be at least 100 stamps. The value of West Nicholson shares is at present difficult to determine.

Olympus.

Adjoining the West Nicholson is the "**Olympus**" claim of the Matabele Gold Reefs, which promises to be eventually as fine a mine as the Nicholson itself.

Eagle-Vulture.

The **Eagle-Vulture** Mine was floated mainly on the strength of the ancient workings, which were of great length and regularity. The development done before flotation was inconsiderable, and consisted of a drive on the first level 800 feet long. The average size of the reef here was three-and-a-half feet, and the value, of which I have no statement in my note-book, was high. A suitable surface equipment and twenty stamps are being erected.

Antenior.—I did not inspect this mine, but I believe there is ore in sight to last ten stamps for one year, and to yield 1 oz. to the ton. The reef, although rich, is said to be irregular, and I do not think enough development has yet been done in this mine to ensure its permanence. The output, in the meantime, may be placed at from 800–1,000 ozs. monthly. Antenior.

I inspected the "Imani" claim of the **V. V. Gwanda** Company. The ore is two feet thick, and has been driven on at the 120-foot level for 100 feet. It is of good value, but broken, and of course not nearly enough work has been done to prove the real value. The "Australian" claim of this Company is said by the manager to be the more promising of the two. V. V. Gwanda.

To the north-east of Gwanda is the **Belingwe** district. Here little work has yet been done. The district is thought well of by mining men at Bulawayo. The **Confidence Mine** and the "Dobie" claim of the **Consolidated Belingwe** Company are said to be promising. On the latter a five-stamp prospecting battery is at work. Belingwe district.

To the north-east of Belingwe, and 110 miles from Bulawayo, is **Gwelo,** the only other town in Matabeleland, except Bulawayo, and the centre of a number of mining districts. The railway to Gwelo, lately authorised by the Chartered Company, will benefit the Selukwe, Victoria, Sebakwe and Sinanombi districts greatly, and from here also the eventual extension to the Zambesi and to Central Africa will be continued. Near Gwelo, a number of claims are being developed, although none, as yet, of note. Gwelo.

Thirty miles distant is the important district of **Selukwe,** where the Bonsor, Dunraven and Selukwe mines are already producing gold. Selukwe district.

Bonsor.

Bonsor.—Issued capital, £220,000. Cash in hand (including profit), at April, 1899, £20,000.

The length of the reef is 6,000 feet; of this the central section has not yet been developed, but from the indications of the ancient workings, there seems no doubt that the quartz continues through this great length. It seems to be now decided that the ground of the Bonsor will be divided between two mines. The new Company will take over a section which is not so fully developed as that now being worked, but which seems to be, on assay results to date, equally as valuable.

Size of mine.

The section of the Bonsor Mine now being worked supplies forty heavy stamps, and ten more will be run shortly. The average width of reef through the whole mine is two-and-a-half feet, opened now to the third level. Above this level there is ore enough to last fifty stamps for seven years, so that each of the mines may be said to contain ore in sight for three-and-a-half years. There is at present a great scarcity of native labour. The assay plan shows the mine to work out at a fair average value along the entire 6,000 feet, although there are considerable patches of unpayable ore. The mine is being soundly worked, and the ore is not being picked. Working costs are unusually low.

Value of Bonsor shares.

An estimate of value for Bonsor shares is as follows:—

(*a*) Fifty stamps will crush 4,800 tons a month; by concentrating, 1,500 tons of 4 dwts. tailings will be secured. Yield from mill and tailings will be 35s. a ton, and total costs 20s. Monthly profit £3,600, or say £40,000 a year.

(*b*) Unworked section of mine to be floated off, of similar extent and probable similar value, £40,000 a year. Total £80,000 a year on a present capital of £220,000, which, allowing for a yield of 15 per cent., gives Bonsor shares an intrinsic value of £2 10s.

No doubt, as is always the case, public opinion will attach to these shares a greater value than actual figures warrant.

Surprise.

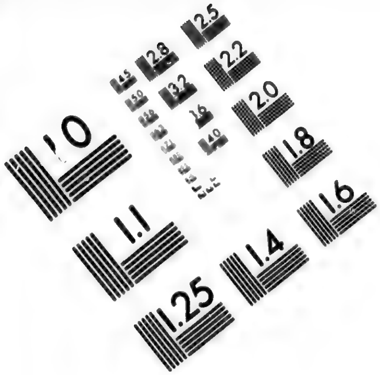
Surprise.—In the Selukwe district, and floated largely on the extent of its old workings. I did not visit this mine, but was told that all the work done to date consisted of five winzes, covering a distance of 1,500 feet. In two of these the reef was said to be poor, and in the other three averaged 18 dwts. over three feet. The depth I did not learn.

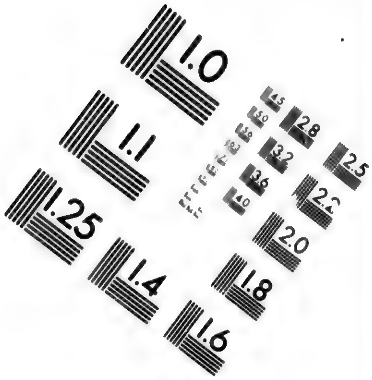
This sort of flotation, made feasible by the anxiety of the public to subscribe to Rhodesian mines, is not, to my mind, justifiable. The Willoughby's Consolidated Company, to which the claim belonged, should have developed it to a much greater extent before floating it. Flotations of this sort will doubtless be responsible for an earlier ending to the Rhodesian "boom," and the consequent drying up of the sources of capital than can be pleasant to those who have the genuine development of the country at heart.

Dunraven.

Dunraven.—Issued capital, £180,000. This mine is considered a doubtful venture by well informed people in Rhodesia. Personally, after inspection, I am inclined to think that though the mine is essentially a small one, and can never become a larger producer than at present, its future on a small scale is assured for a few years to come. There are three reefs, irregular in value, and also in occurrence, but which are all fine looking bodies of quartz, and of considerable width. In the centre of the mine the whole formation turns at right angles, and what the result to the reefs will be, when these disturbances are exposed at a lower depth, is a matter of vital importance. At the time of my visit, 15,000 tons had been crushed altogether, giving a yield of 12½ dwts., or 46s. a ton, but the manager considered that the yield would have to be gradually reduced to about 9 dwts., or 33s. a ton, to represent the average value of the mine. This is from the mill entirely, the tailings being too poor for treatment. The mine is soundly managed, and can be worked for rather less than £1 a ton.

Value of ore.





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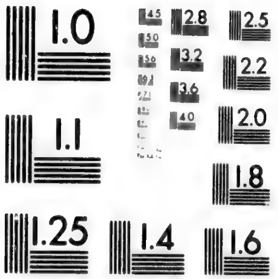

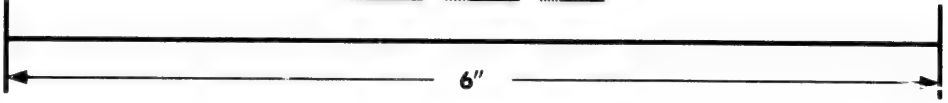

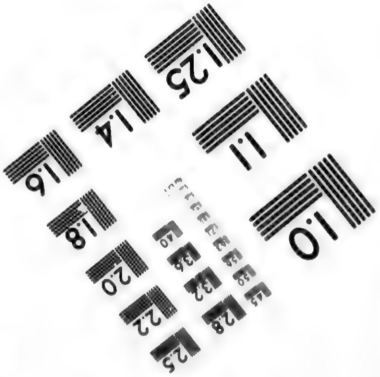

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This would leave a profit of, say, 12s. a ton, or £20,000 a year available for dividend. I think this, on ore in sight, and on what reasonably may be expected to exist elsewhere, might continue for five years, but after that period, pending the proving of the mine in depth, it would be unsafe to venture an opinion.

I would describe Dunraven shares as distinctly speculative above par value.

Selukwe mine.

Selukwe.—Issued capital, £300,000. The old workings here extend along the surface for 3,000 feet. The first level has been driven already 1,800 feet, in payable ore the whole distance, and it is more than likely that the good ore will be found to extend to 3,000 feet as in the old workings. The second level is driven for 250 feet, in good ore throughout. The third level had not been reached at the time of my visit to the mine. The reef is a greyish quartz, dipping at eighty degrees, lying between extremely well-defined walls of schist, and averaging over three feet thick. It is apparently regular in value, and probably the length of good ore is 3,000 feet. In depth it shows no deterioration, and its perfectly defined walls lead me to think that at 500 feet deep it will show as well in every respect as on the first level. To date, the ore has yielded 14 dwts., and the tailings assay about 6 dwts. There are twenty stamps, now being increased to forty, and I see no reason why eventually eighty stamps should not be worked. With forty stamps and cyanide, I think a yield of 55s. a ton probable, and a consequent profit, on 3,800 tons a month, of £5,700. This would leave £60,000 a year available for dividend, commencing from an early date, and I feel bound to state that I think an eventual battery of eighty stamps, and a profit of nearly £10,000 a month, quite probable. At £2 10s., Selukwe shares would prove a profitable investment.

Great value of this property.

Camperdown.

Near Selukwe is the "**Camperdown**" claim, belonging to the Bechuanaland Exploration Company. The reef which has been principally developed is a narrow white quartz lode, rich in

GLOBE AND PHŒNIX—THE RICHEST MINE IN MATABELELAND.

places, but most patchy, and with no signs of permanence. On the same hill are also a mass of ironstone deposits, carrying a little gold, and a body of alluvial, or decomposed reef, which has been worked out by the ancients—a series of several hundred little shafts, connected underground, showing how this was effected. There is undoubtedly a lot of gold in this Camperdown hill, but not, I think, in a payable state, and it is to be hoped that the parent Company will not endeavour to float this.

"Little Wanderer" claim of Charterland Gold Fields.

A few miles distant is the "**Little Wanderer**" claim, belonging to the Charterland Gold Fields, which I also visited. This is an immense lode of ironstone, quartz, shale and other minerals, about 150 feet thick, and apparently continuing for a considerable distance. Work has already been done here to the extent of 3,000 feet, but this is mostly in the shape of parallel drives and cross-cuts on the same level. I believe that the average value of the whole is 7 dwts.; it is also said to be refractory. A deposit of this nature is one of the most difficult problems in gold mining. If the metallurgical treatment can be satisfactorily solved, this lode, low grade though it is, might be made to pay well, but until the treatment decided on is absolutely proved successful, the mine should not be floated.

Sebakwe district.

At the **Sebakwe** district, fifty miles north from Selukwe, there are, besides numerous claims in course of development, the Chicago-Gaika and Globe and Phœnix mines.

Globe and Phœnix.

Globe and Phœnix.—Issued capital, £175,000. This is undoubtedly the richest mine so far found in Rhodesia, and, should the value of ore on the first level continue in depth, will be one of the notable gold mines of the world.

There are two series of reefs, the "Globe" and the "Phœnix," lying at right angles to each other, and 500 yards apart. In each series there are two reefs, and although only one reef in each series has as yet been developed, the evidence of the old workings leaves every reason to think that eventually all four reefs, with an aggregate width of perhaps fourteen feet, will be worked.

Four reefs.

On the "Phœnix," the two reefs will probably junction in depth. Now as to values:—The one reef developed on the "Globe" is proved for 1,200 feet in length on the first or 180-foot level, and, according to the old workings, should be found in existence for 2,000 feet; this reef is also proved below the level, by two incline shafts, for 50 feet further. This is the present bottom of the mine. All the ore in sight is of unusually high value, and is apparently nearly three feet thick. The reef, as in the "Phœnix," is a whitish quartz, lying between schistose walls, and is evidently a fissure vein.

Value of the ore.

On the "Phœnix" the one reef being developed is driven on for 1,000 feet at the first level. The second level is not yet reached. The reef is four feet thick, and, although not so rich as the "Globe," is of good value.

The mines are well laid out, and worked by incline shaft, excellently timbered with Mopani wood. The Company had nearly £200,000 working capital, and there are ample funds in hand for the continuation of developments, for the cost of a pipe line from the Sebakwe river six miles distant, and for the erection of surface works, a rock drilling plant, and a battery and cyanide works. Milling with forty stamps should commence about the end of 1899.

As to the value of the Globe and Phœnix Mine, it is as yet impossible to give an accurate forecast. The consulting engineer and manager consider that the reefs *will* continue to carry their gold in depth. Personally, I also incline to this idea, but as only the first level is as yet known, and as I am always rather sceptical of a mine which produces as much visible gold as the Globe and Phœnix, I cannot venture on an unreserved opinion. If the second level, which will be reached almost immediately, turns out as well as the first, the shares will undoubtedly have a speculative value of £6, and if the third and fourth levels were struck rich the shares would go to £10.

Value of the shares.

On ore in sight, I believe the output from mill and cyanide, with forty stamps, is bound to be 1 oz. to the ton, so that the monthly yield would be about 4,000 ozs., value £15,000, and the profit about £10,000. This, on ore in sight, could continue for two years, but for the future all, of course, depends on value in depth.

Chicago-Gaika.

Chicago-Gaika.—Issued capital, £200,000. These claims lie about two miles from Globe and Phœnix, and there are extensive old workings. Small shafts and winzes have been sunk on seven or eight reefs running through the Kopje. Some of these show patches of extremely rich ore, but none extend for any length, and there is no sign that a lode of permanent value has yet been struck.

Still in a doubtful condition.

The way this mine should be developed is to sink one main vertical shaft to about 350 feet, and then to cross-cut in the hope of meeting the main lode or lodes which at that depth, if they exist, will have become of a permanent nature. This method of work was being attempted, but only with a shaft 170 feet deep. There is no doubt that there is a great deal of gold in the Kopje on which the mine is situated, but as yet it has not been found to exist in a payable condition.

[Since the date of my visit, I understand a rich strike has been made, but, pending details, I should doubt whether this is of permanent value.]

A ROUGH CLASSIFICATION OF MINES, AND OF SOME OF THE MOST PROMISING UNFLOATED CLAIMS, IN RHODESIA.

	FLOATED MINES.	UNFLOATED MINES.
First Class ...	Selukwe. Globe and Phœnix. West Nicholson. Geelong. Bonsor.	Olympus (Matabele Gold Reefs).
Second Class ...	Rezende. Penhalonga. Eagle–Vulture. Antenior. Dunraven. Morven. Nelly and Pioneer. Red and White Rose. Surprise. Beatrice.	Dobie (Belingwe Consolidated). Leopard (Rhodesia Gold Trust). Little Wanderer (Charterland G. F.). Sabiwa (Rice-Hamilton). Marmion (Matabele Gold Reefs). Glendarra (Mashonaland Central).
Third Class ...	Chicago–Gaika. Criterion. Confidence. Christmas Reef. Monarch (Tati). Matabele Sheba.	Australian (V. V. Gwanda). Blanket (Matabele Mines). Ancients (Matabele Gold Reefs). Brisbane (St. Helen's Association). Camperdown (Bech. Exploration). Empress (Rhodesia Limited). Imani (V. V. Gwanda). Jessie (Matabele Gold Reefs). New Prospect (Tati Concessions).

NOTE.—These mines are classified as their value appeared to me at the time of my visit to Rhodesia. A year's development may materially alter—possibly for the better—the prospects of many of them.

CHAPTER X.

A SUMMARY OF GOLD MINING INVESTMENTS.

As briefly as possible, in this concluding chapter, I shall summarise all the good mines previously described, and classify them—in a manner easy to understand—under the heads of investments and speculations.

Advice to investors.

But, firstly, a few words to the investor.

Investments, or speculations, in gold shares, can be systematised to a considerable extent.

There is always a risk in buying, even into the best gold mines, and this risk is greatly heightened by Stock Exchange fluctuations, which frequently occur, quite irrespective of developments at the mine in question.

Make a careful study of the subject.

The first rule to be observed by the investor, is to make a careful study of gold-mining shares. This study may be confined to the mines of one, or two countries, only, or it may be applied —and there is a fine field for this to-day—to the good gold mines of the world.

Buy only in a weak market.

The investor, having fixed on the shares he intends to buy, must remember the second factor in his proposed system of operations. This consists in only buying when the market is weak, and is one of the most important maxims in mining speculation.

Buy only the best shares—whether for investment or speculation.

The third factor is this: to remember that in buying gold shares, as in buying any other commodity, the best article is, in the long run, always the cheapest. This is a fact which, as applied to mining shares, probably requires a great deal of experience to verify; but it *is* a fact nevertheless. The investor should therefore preferably buy the first-class, dividend-paying shares, even at £3 or £5 or £10 a share, rather than the shares of mines which pay small and irregular dividends, and which, he will no doubt find on inspection, have equally uncertain prospects.

The same theory applies to the buying of speculative shares.

I do not wish in the least to confuse the would-be investor with the would-be speculator, but, for the benefit of the latter, I would have him realise that the shares of an unproved but well situated Rand deep level at, say, £5, are theoretically a better purchase than the shares of the average day-by-day flotation at £1.

How to dispose of shares once bought.

Having bought his shares, the investor must clearly decide what he is going to do with them. This is the fourth point in the system. It may seem unnecessary to surmise that the purchaser of gold shares does not know what to do with them, but I am convinced that there are thousands of people in this predicament. They originally bought without having studied the facts about the shares in question ; they do not fully realise whether the mine is a sound property, paying regular dividends, or whether it is purely speculative ; they do not know whether to take a profit when it is offered ; and, having failed to keep themselves posted in the condition of the mine, they do not know whether to take a loss, and put the balance of their capital into another share.

Investments.

But all this is wrong. The investor must buy systematically. If the share is one belonging to the very soundest group of Rand mines, and stands to yield him only 7 or 8 per cent., there is little chance of it going much higher, nor is it likely to have a serious fall. This sort of share may be held permanently.

Speculations.

If the share purchased is that of an irregular dividend-paying mine, or of a speculative mine, it should *invariably* be sold on a good rise. A good rise I would define as a profit of 10s. on a £1 share; £1 on a £3 share; and £2½ on an £8 share.

Profit-taking

But few speculators are sound on profit-taking. They cannot realise that two or three times every year the mining market rises, sometimes much, sometimes only a little, and two or three times a year it regularly falls back to the old level.

For one case in which a speculator, operating on such a system of profit-taking, really sells too soon, there are ten cases in which, after taking a handsome profit, he would be in a position later on to buy back his shares at or about the original price he paid.

is the essence of success in speculation.

Profit-taking is really the crux of successful mining speculation, and even the investor, the holder of the soundest dividend-paying shares, will often find in times of excitement that to sell right out is far the wisest course open to him.

Let me again repeat these points :—

Study the financial side of gold mining.

Buy only in a weak market.

Buy the best (and often the most expensive) shares—whether they be those of dividend-paying mines, or only promising speculations.

Except on the first-class dividend mines take, invariably, a good profit if offered.

Dividend-paying mines.

Actual dividend-paying mines, investments, may be divided into, shall we say, three classes.

In the very first class are the most fully developed Witwatersrand mines, and one other, Mount Morgan, which mine I place in the absolute front of the world's gold mines to-day. It has twenty years' ore in sight, and I am convinced that the mine will be a profitable enterprise fifty years hence.

The leading Rand mines, themselves fully developed, and bounded on both sides and on the deep level by other fully developed mines, are, to my mind, the soundest 7 or 8 per cent. investments that can be secured.

A classification.

In this first class, therefore, to yield only 7 or 8 per cent.—a return hitherto considered as too small for a mining investment—I have no hesitation in placing Mount Morgan and these best Witwatersrand mines.

(*A.*) The best.

(*A.*) A LIST OF THE SOUNDEST GOLD MINING SHARES, WHICH, TO YIELD SEVEN PER CENT., AND REDEMPTION OF CAPITAL INVESTED, MAY BE BOUGHT WITH ABSOLUTE SAFETY, DURING 1899, AT THE PRICES MENTIONED:—

Mount Morgan ...	£5	Jubilee	£7⅞
Bonanza	5¼	May Consolidated ...	5¼
Crown Reef	15¾	Primrose	5⅛
Durban Roodepoort ...	5¾	Robinson	10
Ferreira	26½	Salisbury	3⅝
Geldenhuis	8¾	Treasury	6
Heriot	8	Worcester	3⅜
Henry Nourse	10½	Wemmer	14¾
Jumpers	8		

After this group come a great number of mines which are probably quite as good, and the shares of which have a better chance of appreciating in value, but which are not so thoroughly developed or gauged as the mines already named. After all, it is *ore in sight* which gives a great and permanent value to a mine, and, splendid properties as are many of these following mines, they have not actually got so much ore in sight, relatively to their capital, at the present moment, as the mines of the first group. These mines may be valued on a 10 per cent. basis, but there is every probability that many of them, in the course of a year or two, will be equally as sound undertakings as are now the mines of group A.

(*B.*) A LIST OF SOUND GOLD MINING SHARES WHICH MAY BE SAFELY BOUGHT, DURING 1899, AT SUCH A CAPITALISED VALUE, ON CURRENT DIVIDENDS, AS WILL YIELD 10 PER CENT. INTEREST.

(*B.*) The second best.

(*All Dividends over 10 per cent. on the capital invested must be set aside for Redemption*).

In South Africa :—

City and Suburban.
Wolhuter.
Kleinfontein.
Nigel.
Comet.
Angelo.
Driefontein.
Ginsberg.
Glencairn.
Langlaagte Estate.
Simmer and Jack.
Meyer and Charlton.
Roodepoort United.
Champ d'Or.
Geldenhuis Deep.
Crown Deep.
Rose Deep.
Glen Deep.
Jumpers Deep.
Nourse Deep.
Ferreira Deep.
Village Main Reef.
Robinson Deep.
Durban Deep.

In India :—

Champion Reef.
Ooregum.
Mysore.

In West Australia :—

Associated.
Ivanhoe.
Hannan's Brownhill.
Lake View.
Great Boulder.

In Queensland :—

Brilliant St. George.
Brilliant (P.C.).
Victoria G.M. Assoc.

In New Zealand :—

Waihi.

In British Columbia :—

Le Roi.

A considerable gap, to my mind, separates the mines mentioned in these two groups from all the other dividend-paying mines I have inspected.

Many of the mines to be specified in this third group are fine undertakings, but from one cause or other, the chiefest cause being the limited amount of ore as yet exposed in these mines, I would place the dividend required at from 15 to 30 per cent.

(*C.*) Other dividend-paying mines.

(*C.*) A LIST OF DIVIDEND-PAYING MINES WHICH ARE AS YET ONLY PARTIALLY DEVELOPED, AND ON WHICH THE DIVIDEND REQUIRED SHOULD BE, IN THE MEANTIME, FROM 15 TO 30 PER CENT.:—

In South Africa :—

- The poorer Main Reef mines.
- Sheba.
- Transvaal Mining Estates.
- Glynn's Lydenburg.

In India :—

- Nundydroog.
- Coromandel.

In West Australia :—

- Boulder Perseverance.
- Boulder Main Reef.
- Golden Horseshoe.
- Lady Shenton.
- Queensland Menzies.
- Burbank's Birthday.
- Peak Hill.
- East Murchison United.

In Queensland :—

- Kelly's Queen.
- Victory.
- Day Dawn and Wyndham.
- Papuan.
- Victoria and Queen.
- Band of Hope.
- The leading dividend-paying mines at Gympie and Croydon.

In New Zealand :—

- Waitekauri.
- Progress.
- Crown.

In British Columbia :—

- War Eagle.

Speculations.

Speculative mines, pure and simple, I will divide into two classes—those which *will probably* be eventually successful, and those which *may possibly* be eventually successful.

Two classes.

It must be thoroughly understood that even these purely speculative companies have infinitely more to recommend them than the great majority of floated gold mines, which are not even mentioned in this final chapter, and which are simply worthless.

Let it be remembered that speculative shares must invariably be sold when a good profit can be secured. If, in the meantime, the prospects of the mine in question have passed out of the speculative stage, the value of the shares will have risen proportionately in public estimation, and it will then be for the holder to decide whether he ought not to value the shares on a basis of probable dividend to be paid.

The best, by far, of the speculative mines, are the well located deep level companies of Witwatersrand, which have not yet struck the reef. These form practically a class by themselves.

(*D.*) SPECULATIVE SHARES WITH GOOD PROSPECTS:—

(*D.*) The best.

- Robinson Central Deep.
- Village Deep.
- Angelo Deep.
- South Nourse.
- Knight Central.
- Simmer West.
- South Geldenhuis Deep.
- Rand Victoria.
- Rand Victoria East.
- Jupiter.
- Roodepoort Central Deep.
- Knight's Deep.
- Kalgurli.
- Sons of Gwalia.
- Selukwe.
- Globe & Phœnix.
- West Nicholson.

(*E.*) SPECULATIVE SHARES WITH FAIR PROSPECTS, BUT NOT SO GOOD AS THE SHARES IN GROUP (D.).

(*E.*) The second best.

In South Africa:—

- Modderfontein.
- Main Reef.
- Witwatersrand.
- Vogelstruis.
- Apex.
- West Rand Mines.
- Geelong.
- Bonsor.

In India:—

- Road Block.

In West Australia:—

- South Kalgurli.
- Golden Link.
- Hannan's Oroya.
- Norseman.
- Chaffers.
- Florence.
- Menzies Alpha.
- Menzies Gold Reefs.
- Menzies Mining and Exploration.
- Menzies Gold Developments.

In Queensland :—

Deep Levels at Gympie.
Brilliant Central.
Brilliant Extended.
Bonnie Dundee.
Mills' United.
Day Dawn Freeholds Consolidated.

In New Zealand :—

Woodstock.
Talisman.
Waihi Grand Junction.
New Inkerman.
Waitekauri Extended.
Tararu Creek.
Kauri Freeholds.

In British Columbia :—

Ymir.
Columbia and Kootenay.

The best shares at to-day's prices.

Finally, to view the question of share values from another standpoint, I give a list of the shares of the twenty mines which at or about to-day's prices (March 25th, 1899), appear to be the best purchases, either as investments or speculations, in the gold-mining market. These are as follows :—

Waihi	£6	Village Deep	£6¾
Mount Morgan	5¼	Robinson Central Deep	3¾
Brilliant St. George ...	3½	Selukwe...	2½
Associated	6	Nigel	3½
Great Boulder	1⅛	Ooregum (Pref.) ...	4¼
Kalgurli	7	Champion Reef ...	4¾
Sons of Gwalia	2	Mysore	5
Le Roi	5½	Wemmer	12¼
Ymir	¾	Globe & Phœnix ...	4
Progress (N.Z.)	1⅛	Rose Deep	9½

Conclusion.

I do not wish to end this book with a paradox, but if asked to state, in a sentence, my advice to the investor or speculator, I would reply as follows: "Extreme caution, and a strong bias towards pessimism—only to be relaxed when you have real knowledge of the subject—are the most desirable attributes in gold-mining speculation."

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